ADMINISTRATION OF THE FEDERAL COAL-MINE SAFETY ACT, CALENDAR YEAR 1954

BY JAMES WESTFIELD, H. F. WEAVER, AND C. M. KEENAN

* * * * * * * * * * Information Circular 7734

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FOREWORD

This report presents in full the Annual Report of the Division of Coal-Mine Inspection, Bureau of Mines, for the calendar year 1954, prepared and transmitted to the Congress by the Secretary of the Interior pursuant to the requirements of the Federal Coal Mine Safety Act.

During 1953, the first full year of operation under the act, the coal-mining industry enjoyed the best accident record in its statistical history. It is believed that the report reproduced herein contains pertinent information of sufficient importance to present as an information circular and be made a permanent record as a Bureau publication.

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by

James Westfield,[1] H. F. Weaver,[2] and C. M. Keenan[3]

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INTRODUCTION

This report covers the calendar year 1954 and has been prepared and submitted to the Congress of the United States in accordance with the provisions of Sec. 106(a) and Sec. 212(c) of the Federal Coal-Mine Safety Act (66 Stat. 692; 30 U.S.C. Sec. 451-483).

Background

The Federal Coal-Mine Inspection program was established to carry out the provisions of Public Law 49, 77th Congress, H. R. 2082, approved May 7, 1941. This act has since been amended to be known as Title I - Advisory Powers Relating to Health and Safety Conditions in Mines, under Public Law 552, 82d Congress, approved July 16, 1952, which also includes Title II - Prevention of Major Disasters in Mines. Public Law 552 is known as the Federal Coal-Mine Safety Act.

The Congress passed this act as a result of public indignation and the demands for enforcement powers for Federal coal-mine inspectors after a series of seven appalling major coal-mine disasters that occurred between January 18, 1951, and March 27, 1952. One of these, an explosion in the Orient No. 2 mine, Chicago, Wilmington, & Franklin Coal Co., Ill., on December 21, 1951, caused the death of 119 men.

Under the provisions of Title I, the Secretary of the Interior, acting through the Federal Bureau of Mines, is authorized and empowered to make, or cause to be made, annual or necessary inspections and investigations in coal mines, the products of which regularly enter commerce or the operations of which substantially affect commerce. The principal functions of the Federal coal-mine inspectors under Title I are to determine the causes of accidents and occupational diseases in coal mines and then endeavor to eliminate or ameliorate them (1) by revealing, through personal conferences with mine personnel, correspondence, and published reports, the unhealthful and unsafe conditions and practices existing in the mines and (2) by recommending practical means for correcting the conditions observed. Title I does not provide any enforcement powers, and therefore compliance with the inspectors' recommendations under its provisions is not mandatory; it does give Federal coal-mine inspectors the right to enter coal mines for inspection.

Title I further authorizes and directs the Secretary of the Interior, acting through the Bureau of Mines, to expend the funds made available to him for advancing health and safety in coal mines and preventing or relieving accidents or occupational diseases therein in such lawful manner as he may deem most effective in the light of the information obtained to accomplish the objects for which such funds are granted. To comply with such directive the Division of Coal-Mine Inspection personnel is conducting nationwide safety-education programs for coal-mine officials and coal-mine workmen. In addition, special studies are made of mine health and safety problems relating to roof control, haulage, ventilation, mine disasters, dusts, explosives, gases, electricity, etc.; the results of such

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studies and any improved methods determined from them are made available to the mining industry and general public through published reports.

The current National Bituminous-Coal Wage Agreement between the United Mine Workers of America and Bituminous-Coal Operators provides in part as follows:

> (a) Mine Safety Code.
>
> The Federal Mine Safety Code for Bituminous Coal and Lignite Mines of the United States, adopted pursuant to an agreement dated May 29, 1946, between the Secretary of the Interior and the President of the United Mine Workers of America and promulgated July 24, 1946, is hereby adopted and incorporated by reference in this contract as a code for health and safety in bituminous-coal and lignite mines ---.
>
> (b) Enforcement.
>
> (1) Reports of Federal Coal-Mine Inspectors:- Wherever inspectors of the Federal Bureau of Mines, in making their inspections in accordance with authority as provided in Public Law 49, 77th Congress, find that there are violations of this code and make recommendations for the elimination of such noncompliance, the Operator shall promptly comply with such recommendations, except as modified in paragraph two of the subdivision (b).
>
> (2) Whenever either party to the contract feels that compliance with the recommendations of the Federal mine inspectors as provided above would cause irreparable damage or great injustice, they may appeal such recommendation to the Joint Board of Review as hereinafter provided.

The current Anthracite Wage Agreement between the United Mine Workers of America and Anthracite operators provides in part as follows:

> Mine Safety Program.
>
> (a) Federal Mine Safety Standards.
>
> Inspectors of the Federal Bureau of Mines shall make periodic investigations of the mines, and report to the mine management and the United Mine Workers of America any violations of the Federal Safety Standards.
>
> Operators and Mine Workers agree to accept such standards of safety adaptable and practical to the anthracite industry, subject, however, to the right of review by the Director of the Federal Bureau of Mines, upon petition from the Operator or the United Mine Workers of America.

The Federal Mine Safety Code for Bituminous-Coal and Lignite Mines of the United States and the Safety Standards for Anthracite Mines (now the Federal Mine Safety Code for Anthracite Mines of the United States) have been used as the bases for citing substandard conditions in bituminous-coal and anthracite mines, respectively.

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Title II of the Federal Coal-Mine Safety Act is designed to prevent major disasters in mines the products of which regularly enter interstate or foreign commerce or the operations of which substantially affect such commerce, and compliance with its safety provisions is mandatory. However, it applies only to coal mines in which 15 or more individuals are employed regularly underground. To accomplish this, Title II requires that the Director of the Bureau of Mines shall cause an inspection of each such mine to be made at least annually to determine whether an imminent danger described in Sec. 203(a) exists in any such mine or any provision of the Mine Safety Provisions of Sec. 209 is being violated in any such mine or whether any such mine is a gassy mine as prescribed in Sec. 203(d). It further provides that the Director shall make or cause to be made such special inspections of such mines as may be required by Sec. 203(c) and Sec. 206, and such other inspections of such mines as he deems necessary for the proper administration of Title II. Provisions have also been made for joint inspections of mines with representatives of the inspection agency of any State that desires to cooperate and submits a suitable plan for participation.

The Advisory Committee

Section 108 of Title I provides for the appointment of an Advisory Committee composed of not more than six members to exercise consultative functions when required by the Secretary of the Interior in connection with the administration of Title I. The following persons constitute the present members of the Committee:

Thomas Kennedy, vice president, United Mine Workers of America, Washington, D. C.

W. A. Boyle, assistant to the president, United Mine Workers of America, Washington, D. C.

John T. Jones, president, District 16, United Mine Workers of America, Washington, D. C.

L. C. Campbell, vice president, Eastern Gas & Fuel Associates, Coal Division, Pittsburgh, Pa.

Harry Treadwell, vice president, Chicago, Wilmington, & Franklin Coal Co., Chicago, Ill. (Retired June 1954)

E. C. Weichel, vice president, The Hudson Coal Co., Scranton, Pa.

Meetings of the committee have been held:

Sept. 3, 1941, at Washington, D. C.
Dec. 3, 1941, at Pittsburgh, Pa.
May 12, 1942, at Washington, D. C.
Nov. 5, 1942, at Washington, D. C.
Jan. 28, 1946, at Washington, D. C.
Oct. 3, 1950, at Washington, D. C.

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SUMMARY

Following is a brief résumé of some of the most recent activities of the Division of Coal-Mine Inspection that have had a favorable effect on health, safety, and reduction of injuries at coal mines:

1. There were approximately 8,360 active coal mines in the United States during 1954. In all, 72,566 regular Federal inspections of coal mines have been made since Public Law 49 became effective in May 1941; 10,519 of these inspections were made during 1954.

2. The Bureau of Mines introduced the revised Coal-Mine Accident-Prevention Course for Supervisors into the coal-mining industry on March 1, 1948; since that date 19,310 supervisors and those aspiring to official positions have completed such training conducted by personnel of the Division of Coal-Mine Inspection.

3. The Bureau of Mines introduced the revised Coal-Mine Accident-Prevention Course for Miners in the coal-mining industry on January 1, 1947; since that date 107,690 mine workers have completed such training, including 3,183 in special on-the-job classes conducted by Division of Coal-Mine Inspection personnel assigned temporarily to educational work. In addition, thousands of mine workers have been given specialized training in the maintenance, use, and limitations of permissible flame safety lamps to qualify them to make tests for gas according to the provisions of Sec. 209(d)(9) of the Federal Coal-Mine Safety Act.

4. The Bureau of Mines introduced a short Coal-Mine Haulage Safety Course in the coal-mining industry on April 1, 1951; subsequent to that date 122,170 haulage employees and others completed such training conducted by Federal coal-mine inspectors.

5. The Bureau of Mines initiated a short Coal-Mine Roof-Control Course, designed to impress upon mine officials and workmen the need for more adequate roof-control measures and to make all concerned more roof-control-conscious, on May 1, 1951. This course is very popular and to date has been completed by 218,277 persons.

6. Organizational work to extend the benefits of The Holmes Safety Association is meeting with enthusiastic support from the States, mine operators, and mine workers.

7. The Federal Mine Safety Code for Bituminous-Coal and Lignite Mines of the United States was originally issued by the Director of the Bureau of Mines on July 24, 1946, after consultation with management and labor representatives of the coal-mining industry. The code has been used by Federal coal-mine inspectors during their inspections of bituminous-coal and lignite mines as a basis for determining the existence of unhealthful and unsafe conditions and practices in these mines. A revised code was issued by the Secretary of the Interior on October 8, 1953, following further consultations with representatives of management and mine workers. The agreement of May 29, 1946, between the Secretary of the Interior, acting as Coal-Mines Administrator under authority of Executive Order 9728, and the United Mine Workers of America covering bituminous-coal and lignite mines in Government possession, charged Federal coal-mine inspectors with the responsibility of making periodic investigations of the mines and reporting to the Coal-Mines Administrator any violations of the Federal Mine Safety Code. These inspectors were active in making prompt investigations of hazardous mines that had been closed

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by order of the Coal-Mines Administrator to determine whether enough improvements had been made to allow the mines to reopen. Federal coal-mine inspectors also had temporary authority to close mines they found to be imminently dangerous, but such authority under Executive Order 9728 was removed on June 30, 1947, when Government control of the mines was terminated.

8. The Safety Standards for Anthracite Mines were prepared by personnel of the Bureau of Mines and have been used by Federal coal-mine inspectors as a basis for determining unhealthful and unsafe conditions and practices during their inspections of the anthracite mines of Pennsylvania. These standards were also revised and issued by the Secretary of the Interior as the Federal Mine Safety Code for Anthracite Mines of the United States on October 14, 1953.

9. Public Law 328 - 80th Congress, Chapter 450 - 1st Session, effective for 1 year following its approval on August 4, 1947, required the Secretary of the Interior, acting through the Director of the Bureau of Mines, to submit quarterly reports to the Congress of the United States with respect to the conditions of all bituminous-coal and lignite mines inspected by Federal coal-mine inspectors, all recommendations and notifications sent to the State agencies, and action taken by such mine owners, operators, and the State agencies with respect to his findings and recommendations.

10. Introduction of the bolting method of roof control to the coal-mining industry by the Bureau of Mines in 1948 is a major contribution toward reducing coal-mine accidents. The success of this new method of roof control shows that it is likely to surpass the use of rock dust as a means of preventing loss of life and serious injuries in coal mines. Certain mining engineers and coal-mine inspectors have been especially trained in mine-roof control and roof bolting, and they inform mine operators whether bolting is practical in their mines and, if so, the proper plan of bolting to follow.

11. To further intensify the attack on roof-fall injuries, a program of research and investigation by Bureau of Mines engineers was established in 1953 to develop mobile or portable devices for use at working faces to protect workmen in these areas where most roof-fall accidents occur. The Bureau is also doing the spadework and keynoting on an intensive, cooperative, nationwide campaign to prevent roof-fall injuries, which was organized late in 1954.

12. The advent of roof bolting brought with it a health hazard from dusts produced during drilling in roof rock. The Bureau has been active in eliminating this hazard by cooperating with manufacturers of mining equipment in designing permissible dust collectors that may be used in lieu of water to allay the dust at its source. Bureau of Mines Schedule 25, Procedure for Testing Dust Collections for Permissibility for Use in Connection With Rock Drilling in Coal Mines, became effective January 23, 1952, and was later amended July 23, 1952. Numerous dust collectors have met these requirements and have been approved for use in coal mines under Schedule 25.

13. Federal coal-mine inspectors began investigating all coal-mine fatalities on February 10, 1950. The reports of these investigations are made available to the industry, and the information in them is summarized and published annually with the hope that it will be helpful in preventing accidents in coal mines.

14. On October 2, 1953, a program was inaugurated to have personnel engaged in coal-mine inspection collect detailed information on dust conditions and dust-control

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practices in each coal mine inspected to assist the chief, Branch of Health Research, in assembling such information to determine the extent that occupational disease hazards exist in the Nation's mines as a result of exposure of workmen to dust-laden atmospheres. This program has been completed, and a report thereon is being prepared.

15. Other special studies covering roof control, explosives, gases (including re-storage of natural gas beneath coal measures), fires, explosions, mining, electricity, haulage, ventilation, and control of atmospheric dusts are being made continually as part of the health and safety program set up under the Federal Coal Mine Safety Act. Reports of findings and recommendations are made available to the coal-mining industry.

16. Since 1947, personnel of the Bureau of Mines has assisted in preparing proposed revisions of the coal-mining laws of 12 States. The Bureau of Mines will continue to furnish this service to any agencies directly concerned with improving State mining laws, such as labor organizations, coal-operators' associations, and State officials.

17. In response to letters from the Secretary of the Interior to the Governors of coal-producing States and personal contacts by field personnel, State-participation plans for joint State-Federal coal-mine inspections, as provided for under Sec. 202(b) of Title II, Federal Coal Mine Safety Act, have been approved and are in effect in Alaska, North Carolina, North Dakota, Oklahoma, Washington, and Wyoming.

18. Members of the Division of Coal-Mine Inspection take an active part in national, regional, and local safety organizations throughout the coal-mining areas.

19. Coal-mine inspectors and engineers of the division have served on foreign duty in response to requests from other Federal agencies. This provides such agencies with the technical knowledge and wide experience of these experts, and the assignees have the opportunity to add to their fund of knowledge and make pertinent information available to the mining industry in this country.

20. The Division of Coal-Mine Inspection has entered into a cooperative agreement with the Wage and Hour and Public Contracts Divisions of the U. S. Department of Labor, whereby the Bureau of Mines field office promptly notifies the regional office of the Wage and Hour and Public Contracts Divisions of disaster hazards in mines that are not covered by the mandatory provisions of Title II but are under contract to furnish coal to the Federal Government. The operators of such mines face cancellation of Government contracts if the hazards are not eliminated promptly.

The health and safety conditions in coal mines in the United States have been improving steadily since Federal coal-mine inspections were instituted. However, the frequency of roof-fall fatalities and minor mine fires and gas or dust ignitions indicates that much remains to be done before the conditions in many mines can be considered even fairly satisfactory.

The enactment of the Federal Coal Mine Safety Act, July 16, 1952, affords under Title II limited enforcement powers to the Federal coal-mine inspectors with respect to certain safety provisions that might cause or lead up to a major disaster in underground mines that regularly employ 15 or more men underground. However, the act is not designed to and prescribes no mandatory provisions to prevent the so-called day-to-day accidents that result in over 90 percent of the coal-mine fatalities or

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to prevent accidents in mines that employ regularly less than 15 men underground, which, as a group, usually have high accident-frequency rates. This large field is left to cooperative efforts among the Federal Bureau of Mines, the State agencies, employers, and employees. The enforcement of rules and regulations in the field of day-to-day accidents, safety, health, and welfare is clearly left within the jurisdiction of the several States.

There is no doubt that much more can be accomplished if the mandatory safety provisions of the act are extended to cover mines that employ regularly less than 15 individuals underground, which, as a group, are poorly regulated. This is borne out by the fact that 39 percent of the inspection reports on these mines indicated dangers of a serious nature that were not corrected promptly, and only 16 percent of all the dangerous conditions reported were being corrected during the period covered by this report. Also, the frequency rate for underground fatalities at Title I mines in 1954 was 4.22 as compared with a frequency of 1.01 for underground fatalities at Title II mines.

EMPLOYMENT OF PERSONNEL

Coal-mine inspectors, electrical inspectors, and engineers of the Division of Coal-Mine Inspection are selected from the Civil Service register, and applicants must meet the rigid requirements set up by the United States Civil Service Commission before their names can be included in the register. On July 19, 1954, the register was closed against the acceptance of additional applications.

The current requirements for the several grades of Federal coal-mine inspectors are as follows:

United States Civil Service Commission
Requirements for Federal Coal-Mine Inspectors

Written Description of Some Phase of Coal Mining

Applicants must submit with their application a 300-word description of some phase of coal mining, such as the ventilating system, haulage system, or timbering methods used in a mine familiar to the applicant. The applicant must prepare the description, and he must certify in his own handwriting that he received no assistance in composing it. Applicants who fail to submit this written description, or who submit an unsatisfactory one, or who submit statements copied from texts or other sources of which they are not the authors, will receive no further consideration under this announcement.

Experience

Applicants must show, as a mininum, the quality and amount of experience prescribed hereafter, unless they substitute education for experience (see Substitution of Education for Experience following). To establish eligibility in any grade, at least 1 year of the required experience for that grade must have been acquired during the 4 years immediately preceding the date of filing application.

GS-9, $5,060 - Six years of progressive experience in practical coal mining, of which at least 2 years must have been specialized experience in coal-mining operations of medium size that involved responsibility for providing adequate modern safety and health programs in a position of at least the responsibility required of a mine superintendent, mine foreman, mining engineer, or safety

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inspector. The nature of the experience must have been broader than that of a fire boss, mine examiner, or section foreman and must have demonstrated the ability to perform important coal-mine inspection work under general supervision.

GS-11, $5,940 - Seven years of progressive coal-mining experience, of which 3 or more years must have been specialized experience that required supervision of difficult, important, and responsible work subject only to general supervision and review in a position of at least the responsibility required of a mine superintendent, mine foreman, mining engineer, or safety engineer. The experience must have included the direction, application, and enforcement of modern coal-mine safety and health programs. This experience must also have demonstrated that the applicant has (1) a thorough knowledge of the basic principles applicable to modern programs for promotion of safety and health in coal mines; (2) the resourcefulness, initiative, and ability to perform, direct, and coordinate moderately large scale mine-inspection work of considerable difficulty; and (3) administrative ability, tact, and judgment necessary to promote programs for improved safety, health, and working conditions in coal mines and in applying mine safety regulations.

GS-12, $7,040 - Eight years of progressive experience in the various operations necessary in development and production in coal mines, including at least 4 years of difficult, important, and responsible specialized work that was subject to only a general administrative supervision in a capacity such as direct supervisor. This work must have included full responsibility for directing and applying modern coal-mine safety and health programs. This experience must have demonstrated that the applicant has (1) a thorough knowledge of the basic principles applicable in modern programs for promoting health and safety in coal mines; (2) the resourcefulness, initiative, and ability required in a position of at least the responsibility of mine manager, mine superintendent, mining engineer, or safety engineer; (3) the ability to perform, direct, and coordinate large-scale mine-inspection work of unusual difficulty; and (4) administrative ability of a high order, along with the tact and judgment necessary to administer safety regulations and to conduct important conferences with interested parties, such as coal-mine operators, labor organizations, and the general public, on matters related to safety and health of workers engaged in coal mining.

Provisions of Law

Section 109 of the Federal Coal-Mine Safety Act under which these positions are established provides:

> That in the selection of persons for appointment as coal-mine inspectors no person shall be so selected unless he has the basic qualification of at least 5 years practical experience in the mining of coal, and is recognized by the United States Bureau of Mines as having the training or experience of a practical mining engineer in those essentials necessary for competent coal-mine inspection.

The provisions of law quoted above are made a part of the requirements of this examination. Persons whose qualifications are not such as to receive the recognition of the Federal Bureau of Mines as required by law cannot be accorded an eligible rating in this examination. The nature of each applicant's experience and the required degree of ability will be carefully determined before eligibility and rating are decided. Experience will be evaluated on the type, size, and difficulty of operation in mines in which the applicant has had supervisory responsibility.

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Substitution of Education for Experience

A successfully completed course of study in engineering at an accredited college or university may be substituted for part of the required general experience on the basis of 1 year of education for 6 months of experience. Such substitution will be limited to 1 year of required general experience in GS-9 grade and to 2 years of required general experience in the GS-11 and GS-12 grades. In each instance, however, the applicant must show the total required amount of specialized experience.

The successful completion of college work in nonaccredited institutions will be accepted on the same basis as indicated for accredited colleges under the requirements for the position, provided that such institutions give instruction of definitely collegiate level and that the State university of the State in which the institution is situated accepts the courses and gives advanced credit for them. (In those States where there is no State university, the evaluation and acceptance of college credits as made by the State department of education will be accepted.)

Ability to Drive Automobiles

Applicants must give evidence that they can operate automobiles. Possession of a valid automobile operator's license in the State of legal residence of an applicant will be accepted as evidence.

Citizenship

Applicants must be citizens of or owe allegiance to the United States.

Age

Applicants must not have passed their 48th birthday on the date of filing application.

Physical Abilities

Applicants must be physically capable of performing efficiently the arduous duties of this position. They must be free of such defects or diseases as may constitute an employment hazard to themselves or endanger fellow employees or others. They must be capable of sustained physical exertion for 6 to 8 hours per day under such hazardous conditions as traveling over rock falls, on steep pitches, in adverse atmospheric conditions, and under low roof where it is frequently necessary to crawl on the hands and knees. Inspectors entering a mine to make an inspection normally carry equipment weighing up to 20 pounds. In emergencies following a mine disaster, they may be required to work for several 2-hour periods a day carrying rescue apparatus, which weighs about 40 pounds. Arms and legs must be sufficiently intact and functioning to permit the applicant to perform the duties described above. Vision must be at least 20/50 Snellen in one eye and 20/70 in the other, without glasses. The ability to distinguish basic color is essential. Hearing, with or without a hearing aid, must be acute enough to enable the applicant to hear ordinary conversation at 20 feet. These standards must be met by all applicants; however, certain requirements may be waived for veterans who can demonstrate ability to perform the duties efficiently and safely.

In view of the strenuous physical exertion required for this position, hernia (whether or not supported by truss), organic heart disease (whether or not

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compensated), varicose veins (unless slight), serious deformities or disabilities of extremities (including weak feet), mental or nervous disease, chronic respiratory or chronic constitutional disease, or other physical defect that would cause the applicant to be a hazard to himself or others or would prevent efficient performance of the duties of the position will disqualify him for appointment.

Applicants will be required to submit a certificate of physical examination upon request, and a check physical examination will be made by a Federal medical officer before the oath of office will be administered at the first post of duty. Persons who are offered appointment must pay their own expenses in reporting for duty. If, upon reporting at the place of assignment, they are found to be ineligible because of physical defects, they cannot be appointed, and no part of their expenses in returning home can be paid by the Government.

Basis of Ratings

No written test is required. Applicants' qualifications will be rated on a scale of 100 and will be judged from a review of their experience, education, and training and on corroborative evidence. Applicants may be required to present proof of qualifications claimed but should not submit such proof unless it is requested. Exaggeration or misstatement or the submission of a sample of written work that is not the applicant's own will cause disqualification or dismissal from the service.

United States Civil Service Commission Basic Requirements for Mining Engineers

Applicants for the position of mining engineer must have completed successfully a full 4-year professional curriculum leading to a bachelor's degree in an accredited college or university or have had 4 years of successful and progressive experience in technical engineering comparable to that which would have been acquired through successful completion of a full 4-year engineering curriculum in an accredited college or university.

Tentative Selection and Probational Appointment

After a coal-mine inspector or engineer has been selected from the Civil Service register for possible employment, he is interviewed by a Bureau of Mines official to determine his fitness for the position. If the interview discloses that the applicant is unsuitable for employment, he is no longer considered for the position. If the applicant is considered favorably and has passed the required medical examination, he is given a 1-year probational appointment. Probationers who do not meet Bureau of Mines standards are separated from the service in accordance with Civil Service regulations.

TRAINING OF PERSONNEL

Inspectors and engineers usually are given a 4-week course of intensive training in technical matters and Bureau policy at the Bureau of Mines Central Experiment Station, Pittsburgh, Pa., before being assigned to field headquarters. However, in those instances when an inspector is employed to replace an inspector who leaves the service, the new inspector is given on-the-job training first by accompanying experienced inspectors and completes the 4-week training course at Pittsburgh as soon as enough replacements are employed to constitute a class.

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The classwork includes lectures, demonstrations, and laboratory work covering such vital subjects as roof control, haulage, mine rescue training, first-aid training, causes and prevention of mine fires and explosions, mine gases and methods of detection and control, mine electricity, ventilation, explosives, methods of collecting and analyzing dust and air samples, method of conducting a coal-mine inspection, method of preparing inspection and investigation reports, operation of automobiles, and general policy matters.

New inspectors are required to accompany experienced inspectors until they have demonstrated their ability and are authorized by the Director to conduct inspections without immediate supervision. They are admonished to go slowly with their first inspections and to be very careful and thorough so that hazards are not overlooked. The need for thoroughness is emphasized throughout the training period and is reemphasized from time to time thereafter so that there is no misunderstanding of Bureau policy.

One or more coal-mine inspectors of outstanding ability are assigned in certain field office areas to assist the field officials in supervising the coal-mine inspectors under their jurisdiction. The supervising inspectors accompany the regular inspectors, instruct them when necessary to improve the quality of their work, and submit reports of their observations for critical review and appropriate action.

Coal-mine inspectors and engineers are called upon from time to time to teach the Bureau's accident-prevention courses, to address meetings of persons interested in mine safety, and to confer with groups of mining men - all for the purpose of selling safety. To assure that the inspectors and engineers are better equipped to perform these duties effectively, they have been given a short course of instruction in the conference method of teaching by a nationally known authority on vocational industrial training. Personnel of the McAlester Station completed this training in 1954.

NATIONAL PROMOTION POLICY

A new national promotion policy for Federal coal-mine inspectors was approved and became effective January 1, 1955. It provides in part as follows:

> Policy with regard to grades of coal-mine inspection personnel is as follows:
>
> Grade GS-13 is usually associated with managing a subdistrict office covering a very large geographic area (one or more States) in which there is scattered coal mining or a small area in which coal-mining activity and the complexities of operation are concentrated to the extent that it is necessary to impose responsibilities and complexities of management on a supervisor equivalent to that intended by classification standards for grade GS-13. There are exceptions to this in that some highly specialized jobs not involving management of offices or employees are classified to grade GS-13.
>
> Grade GS-12 is associated with minor management responsibilities with corresponding reduction in supervision, management, and specialized technical assignments of difficult and complicated nature requiring exercise of above-average judgment and tact.

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Grade GS-11 is considered the journeyman grade for coal-mine inspection with closer supervision and more limited exercise of independent judgment.

Grade GS-9 is considered the apprentice grade for coal-mine inspection. Covers inspections with inspectors of higher grades and inspections of the least difficult mines without immediate supervision as part of the inspector training program.

It is the established policy that additions to the coal mine inspection staff shall be made in grade GS-9, and that it is the responsibility of the District Supervisor to provide training and supervision for inspectors in grade GS-9, particularly during the probationary or trial period, necessary to develop and train those individuals and prepare them for journeyman status. The District Supervisor shall subject those individuals to appropriate tests to determine their proficiency. On full proof of an inspector's ability to assume journeyman status, the District Supervisor shall so certify with recapitulation of evidence in support of his finding. After approval by the Assistant Director—Health and Safety, the personnel office having jurisdiction shall proceed with promotion of the individual to grade GS-11 at the then place of employment if the inspector is already doing or is to be immediately assigned in that area for a considerable portion of time to the kind of inspection work classifiable to grade GS-11 subject to limitations inherent in law and regulation. Promotions made other than by certification from the register shall be reported monthly to the Chief Personnel Officer so that the register may be kept current.

It is the policy that the number of positions in each grade shall be flexible and determined by the exigencies of the work as it expands or contracts with changes in the industry, or in the goals set within the Bureau. A system for promotion from grade GS-9 to GS-11 and GS-11 to GS-12 is provided hereinafter.

Inasmuch as the work and responsibilities of Grade GS-13 positions require exercise of judgment, tact, initiative, and other special qualifications not practical for measurement by a fixed formula, such as is used for the promotion register, positions in grade GS-13 shall be filled only on the basis of selection by joint action of officials in higher echelons.

It is the policy that coal mine inspection positions shall be occupied only by men who are physically fit to perform at any time the rigorous work involved. To insure compliance with this policy it shall be the duty of each District Supervisor to see that each coal-mine inspector is given a full physical examination at Federal expense at intervals of not more than five years, preferably three years after age 60, or more frequent if considered necessary. This examination shall include full-plate chest X-ray and electrocardiogram, and shall be concluded with a statement by the examining physician as to the man's ability to perform the arduous work of a coal-mine inspector. If an inspector is not able to perform such arduous work, the District Supervisor shall move through appropriate channels, for disability retirement of the individual or other corrective measures. This

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procedure shall be applied to all persons whose job title is Coal Mine Inspector in grades GS-9, GS-11, GS-12, and GS-13, and all other coal mine inspection personnel, regardless of grade or title, whose position requires that they perform such arduous work.

ORGANIZATION

The Congress appropriated $3,645,000 to carry on the work of the Division of Coal-Mine Inspection during the fiscal year 1955. This provided for a total force of 273 coal-mine inspectors, 34 mining engineers, 6 mining-electrical engineers, 5 mining-explosives engineers, 10 electrical inspectors, administrative officials, and supporting personnel.

Coal-mine inspectors, electrical inspectors, and engineers are headquartered at strategic places in the coal-producing areas in the United States.

Reorganization of the Health and Safety activities of the Bureau of Mines based on a report of a survey team made up of persons from private industry who were appointed by the Secretary of the Interior became effective December 19, 1954, in accordance with Administrative Order 695, issued by the Director of the Bureau of Mines, December 8, 1954, which is presented in part herein as Appendix A.

INSPECTION PROCEDURE

The Federal Mine Safety Codes are used as the bases for determining unsafe and unhealthy conditions and practices in all coal mines inspected, and the safety provisions of Title II, Federal Coal Mine Safety Act, are mandatory at all coal mines that employ 15 or more individuals underground regularly.

The standard procedure for inspecting all coal mines (under Title I and Title II), briefly, is as follows: Generally, notification of an inspection is not given to the mine operators or the miners. The regular inspection may require from a day to several weeks, depending on the size of the mine, the thickness and pitch of coal beds, the system of mining, the degree of concentration of working places, the prevalence of hazardous conditions and practices, and other conditions. The inspector is required (a) to inspect every working place in the mine, all active haulageways, entrances to abandoned workings, accessible old workings, airways, escapeways and other places where men work or travel or where dangerous conditions may exist, electric equipment and installations, haulage facilities, first-aid equipment, ventialtion facilities, communication installations, roof and rib conditions, blasting practices, surface plant, etc.; (b) to test for gas and oxygen deficiency in all mines and to collect samples of mine air and mine dusts for chemical analysis, if necessary, to determine precisely the conditions with respect to noxious and explosive gases, oxygen content, and coal dust and rock dust.

In multiple-shift operations the inspector is required to devote part of his time to inspection on each shift so that hazards are not inadvertently overlooked and to spend enough time at the active working faces to observe, wherever practicable, a complete cycle of operations, including cutting, drilling, blasting, loading, hauling, support of roof, etc.

To assure that the principle of States' rights would be preserved, Title II provides for joint Federal-State inspections when a State desires to cooperate in such activities. The Director of the Bureau of Mines is required by the act to cooperate with the official mine-inspection or safety agencies of the coal-producing

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States. Title II provides further that any State desiring to cooperate in making joint inspections may submit a State plan for carrying out the purposes of this part of the act. Such plans shall designate an authorized State safety or inspection agency to administer the plan and give assurance that such agency will employ an adequate and competent staff of inspectors, assign its inspectors to participate in inspections in the State under Title II, and make such reports to the Director of the Bureau of Mines as the Director may require from time to time. The Director, however, is required to approve any State plan that complies with the specific provisions. The Director may withdraw his approval and declare such a plan inoperative if he finds that the State agency is not complying with the spirit and intent of any provision of the State plan.

Where a State plan is not adopted, the Federal coal-mine inspector is responsible under Title II to take 1 of 2 courses of action if he finds certain hazardous conditions during his inspections:

a. The first action involves imminent danger. If a Federal inspector finds danger that a mine explosion, mine fire, mine inundation, or man-trip or man-hoist accident will occur in a mine immediately or before the imminence of such danger can be eliminated, he issues a written order requiring the operator of the mine to cause all persons, except certain public officials and those specifically permitted by law to correct the conditions, to be withdrawn from and debarred from entering the area described in the order. The operator is not permitted to resume normal operations in such an area until: (1) The conditions specified in the order are corrected to the satisfaction of three duly authorized representatives of the Bureau of Mines appointed by the Director after receiving an application from the operator for annulment or revision of such order, and the order has been annulled or revised by the Director, or (2) the Federal Coal Mine Safety Board of Review finds that, after receiving an application from the operator for annulment or revision of the order and after a formal hearing, the condition described in the order was erroneous or no longer exists.

b. The second action involves one or more violations of the Mine Safety Provisions set forth in Sec. 209. If a Federal inspector finds that any such mine safety provision is being violated and that the violation does not cause danger that an explosion, fire, inundation, or man-trip or man-hoist accident will occur in such mine immediately or before the imminence of such danger can be eliminated, he is required to issue a written notice to the operator, giving the operator a reasonable time for correcting the violation. If, upon making his special inspection after the expiration of such reasonable time to determine whether the violation has been abated in the time originally specified, the Federal inspector finds that the violation has been totally abated, he issues another written notice to that effect. If the inspector finds that the operator should be given additional time to abate the violation, he grants an extension of time in writing. If, however, the violation is not abated and the Federal inspector finds that circumstances, such as obvious lack of effort by the operator to correct the condition, do not justify granting an extension of time, he issues a written order requiring the operator to cause all persons, except certain public officials and those specifically permitted by law to correct the conditions, to be withdrawn from and debarred from entering the area described in the order. Here again, the operator is prohibited from resuming normal operations in the affected area until the order is annulled or revised by the Director of the Bureau of Mines or by the Federal Coal Mine Safety Board of Review under the same procedure as described for imminent dangers. Any final order by the Board is subject to judicial review by the United States Circuit Court of Appeals, upon notice of appeal by the Director or the operator.

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Where a State plan has been adopted, no representative of the Bureau shall inspect a mine under Title II unless a State inspector participates in such inspection in accordance with such plan, except where, in the Director's judgment, an imminent danger is deemed to exist and participation by a State inspector would unreasonably delay such inspection. If a Federal inspector issues a withdrawal order citing an imminent danger under Sec. 203(a) and a State inspector did not participate in the inspection on which such order is based, the mine operator may request the State agency to assign an inspector to inspect the mine, which must be complied with promptly.

Title II further provides that no withdrawal order shall be issued as a result of failure of an operator to abate a violation of a mine safety provision that does not present an imminent danger under Sec. 203(a) at the expiration of the time originally set or extended for abatement at a mine in a State in which a State plan is in effect unless a State inspector participated in the inspection and concurs in such order. If the State inspector does not concur in such order, the operator or the State or Bureau representative may apply to the chief judge of the United States District Court for the district in which the mine is located for appointment of a qualified independent inspector to inspect the mine. If, after such inspection, either the independent or the State inspector concurs in the order, it shall be issued.

Withdrawal orders issued with respect to a mine in a State in which a State plan is effective are not subject to review by the Director but are subject to review by the Federal Coal Mine Safety Board of Review.

In response to requests, sample plans for State participation were drafted and submitted to Alabama, Arkansas, Kansas, Montana, North Carolina, Oklahoma, Washington, and Wyoming to serve as guides in formulating plans for submission to the Director for his approval. On September 29, 1952, a plan submitted by Wyoming was the first to be approved by the Director. Since then five additional plans have been approved. The States involved and the effective dates of the plans are: Washington, December 17, 1952; Oklahoma, February 13, 1953; North Dakota, February 16, 1953; North Carolina, March 27, 1953; and Alaska, June 15, 1953. During 1954, 17 joint State-Federal inspections were made in Wyoming, 21 in Washington, 18 in Oklahoma, and 4 in Alaska, a total of 60. (See Appendix B, table 1.)

Each coal-mine inspector is assigned a district comprising mines that he inspects regularly. This procedure was adopted in 1948 and has resulted in a greater personal interest on the part of the inspector to have the mines under his jurisdiction in the safest condition possible and to keep accidents in them to a minimum. Inspectors are responsible for devising ways and means of reducing accidents in their respective districts, and they are required to improve the effectiveness of their inspections by:

a. Determining the outstanding causes of accidents at the mine to be inspected; this information is used during the inspection as a guide in detecting hazards.

b. Discussing observed hazards and means of correction with the accompanying official at the time the hazard is discovered, with the mine safety committeemen, when feasible, and with high company officials when a conference can be arranged.

c. Enlisting the cooperation of labor, management, State inspection personnel, and all other safety-promotion agencies.

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d. Becoming acquainted with management, the officials of the mine workers' organization, and the mine safety committeemen.

e. Attending local union meetings occasionally to discuss safety with the members and endeavoring to promote cooperation in accident-prevention work.

f. Participating in mining institutes, Holmes Safety Association chapters and councils, and other agencies dedicated to promoting mine safety.

g. Assuming a personal interest and a definite personal responsibility in preventing accidents.

h. Investigating all fatal coal-mine accidents in the respective districts.

i. Assisting in rescue, recovery, and investigation following mine disasters.

j. Assisting mine officials to improve the methods of operation with a view toward greater efficiency, economy, and safety.

k. Conducting first-aid and mine rescue training and officiating at first-aid and mine rescue contests.

PROCEDURE FOR PREPARING AND DISTRIBUTING COAL-MINE INSPECTION AND INVESTIGATION REPORTS

A preliminary report is prepared by the inspector according to standard regulations following the completion of a regular inspection of a coal mine that employs less than 15 men underground only if hazards of primary importance are observed. Preliminary reports are not prepared for strip mines. Mines that employ less than 15 men underground and strip mines are hereafter called Title I mines.

The preliminary report, indicating unsafe conditions and practices considered of primary importance, is prepared by the inspector and posted by him at the mine within 1 day following completion of the inspection. Typed copies of the preliminary reports are distributed by the field offices of the Bureau of Mines to the mine officials, the State mine-inspection agency, the district and national offices of the mine workers' organization having jurisdiction at the mine, the Washington Office of the Bureau of Mines, and the Geological Survey if the mine is on the public domain or Indian land.

Preliminary reports are not prepared following inspections of mines that employ regularly 15 or more men underground, hereafter called Title II mines. In lieu thereof, withdrawal orders, citing imminent dangers under Sec. 203(a), or notices, citing violations of Sec. 209, Mine Safety Provisions, that do not appear to be imminent, as provided under Sec. 203(c), or an order classifying the mine gassy under Sec. 203(d) are issued by the inspector to the mine operator during or at the completion of an inspection, and copies are posted on the mine bulletin board. Typed copies of such notices or orders are distributed by the field offices of the Bureau of Mines to the mine officials and the same agencies that would receive copies of the preliminary reports.

A final report on each inspection, prepared promptly by the inspector, contains a general description of the property and of conditions and practices observed during the inspection. All unsafe conditions and practices are recorded in detail, and proper recommendations are made to correct them. Where applicable,

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violations of the safety provisions of Title II that are observed during the inspection are cited, and the action taken to have the violations abated is indicated. Results of chemical analyses of dust and air samples collected during the inspection are listed in the report to provide additional information with respect to conditions at the mine. Substandard and dangerous conditions that are eliminated during the inspection and between inspections are also presented.

Final reports on inspections of coal mines are prepared and mimeographed in the field offices and distributed from there to management, the State mine-inspection agency, the national and district offices of the mine workers' organization, the Joint Industry Safety Committee (bituminous-coal mines that are affiliated with the UMWA), the Washington Office of the Bureau of Mines, and the Geological Survey if the mine is on the public domain or Indian land.

Enough reports are reviewed in the Washington office after they have been transmitted to all concerned to assure that the rules for preparing and distributing reports are being followed and to obtain information on serious hazards and violations of the safety provisions of Title II.

A press release covering salient features of certain reports is prepared and sent to the newspapers in the area where the mine is situated.

The posting and distribution of the reports, the press releases covering them, and the filing of the reports in the Bureau of Mines field and departmental offices for public inspection constitute compliance with that part of the act requiring publication and dissemination of findings.

Reports covering investigations of all fatal coal-mine accidents, of nonfatal serious roof-fall accidents, of major and minor coal-mine disasters, and of mine fires and ignitions that are not of disaster proportions are prepared, and they are distributed by the field offices to all agencies and persons that ordinarily would receive copies of the regular inspection reports.

FOLLOWUP PROCEDURE

Under the mandatory provisions of Title II, special inspections are made by an inspector at the expiration of time periods set or extended as reasonable for abatement of violations of Sec. 209 and, in instances where men have been withdrawn, upon orders from the Director of the Bureau, in response to a request from the operator, to determine whether the violations have been totally or partly abated.

The inspector can order an operator to withdraw men from a mine or a portion of a mine summarily if an imminent danger is deemed to exist or if the operator has not made a reasonable effort to abate a violation of Sec. 209 at the expiration of the time that has been set or extended for abatement.

Sec. 205 provides for creation of a Federal Coal Mine Safety Board of Review to hear and determine applications filed pursuant to Sec. 207 for annulment or revision of orders made pursuant to Sec. 203 or Sec. 206. In compliance with these provisions, on August 21, 1952, the President appointed A. U. Miller, C. R. Ferguson, and J. G. Solari to serve as members of the first Board. Mr. Miller was named chairman. During 1953, E. R. Price, manager of coal properties, Inland Steel Co. (retired), was appointed as the operators' representative in place of Solari, resigned, and Edward Steidle, Dean Emeritus, School of Mineral Industries, Pennsylvania State University, replaced Miller as chairman. Mr. Ferguson continues to serve as the representative of the coal-mine workers.

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Sec. 206 provides that an operator may apply to the Director for annulment or revision of an order issued under Sec. 203. However, where a State-participation plan is in effect, application for annulment or revision of a withdrawal order must be made directly to the Federal Coal Mine Safety Board of Review.

Inasmuch as the Federal coal-mine inspectors have no authority to require compliance with their recommendations made under the provisions of Title I, every reasonable and practical effort is made to get these unsafe conditions and practices corrected. One method is to enlist the cooperation of the State mine-inspection agencies, which generally have authority to require the correction of hazards. When an inspector observes unduly hazardous conditions or practices that are not covered by Title II while inspecting a mine, he informs the local mine officials. If prompt action is not taken to correct the hazards, he so advises the mine safety committeemen and also the Bureau of Mines official in charge, who promptly relays the information to the State mine inspector and the head of the State mine-inspection agency by telephone, confirmed by letter, or by letter only, as the exigencies of the case indicate. In addition, the statement of the hazard and the recommendation for its correction are capitalized in the final report to call special attention to them. Such procedure has resulted in the elimination of many very serious hazards in the mines.

The condition of many coal mines in the Nation is evident when it is known that 39 percent of all inspections of mines exempted from the provisions of Title II made during 1953 revealed hazards that were serious enough to justify sending special notices to the heads of the State mining agencies. Records regarding serious hazards observed in coal mines that are not covered by the mandatory provisions of Title II are included in Appendix C of this report.

Such followup procedures undoubtedly have considerably improved practices and conditions in many mines and reduced coal-mine injury rates.

Three of the 325 orders requiring withdrawal of men from underground areas have been appealed to the Federal Coal Mine Safety Board of Review; and one of these, issued under a State-participation plan, could not be appealed to the Director under the provisions of the act. In each instance where a withdrawal order has been issued and the operator has appealed to the Director of the Bureau of Mines, claiming that the dangerous condition was corrected, such appeals have been acted upon promptly. The Bureau is as much interested as the operators in causing no undue delay in reopening mines after violations of the law are corrected. In each instance, after prompt special investigation by three duly authorized representatives of the Bureau of Mines, the Director verified that the conditions had been corrected, the inspector's order was annulled, and the mine was permitted to resume normal operation.

During the 30-month period, ended December 31, 1954, in which the Federal Coal-Mine Safety Act has been in effect, 7 applications for annulment of gassy classification orders under Sec. 203(d) were made to the Director; 5 of these applications were denied, and 2 of the orders were annulled. Three of the Director's decisions denying annulment were appealed to the Federal Coal-Mine Safety Board of Review; 1 of these was upheld by the Board, and 2 were reversed. One application for annulment of a gassy classification order that was made directly to the Board was denied. One withdrawal order issued under a State-participation plan according to the provisions of Sec. 203(a) citing imminent explosion dangers was annulled by the Board after finding that the dangers had been eliminated, and the Board revised one withdrawal order issued under 203(c) for failure to abate violations of Sec. 209(d)(9) by extending the time for abatement to permit training enough men in the

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maintenance, use, and limitations of permissible flame safety lamps to make the required tests for gas. Upon request of the operator the Bureau provided personnel for this specialized training, at the completion of which the violation was abated and the order was annulled by the Director. See Appendix D.

REGULAR INSPECTION WORK ACCOMPLISHED

According to a Bureau of Mines survey, 8,360 coal mines were operated more or less regularly during 1954. A tabulation showing the number of coal mines (by types and States) operated in 1954 is included in table 1 of Appendix E.

Reference to the performance data in Appendix E will reveal that:

a. 10,519 regular inspections of coal mines were made during 1954 (table 2).

b. 72,566 regular inspections of coal mines have been made since 1941 when Public Law 49 became effective (table 2).

c. 4,293 of the 5,515 active coal mines employing less than 15 men underground (Title I mines) were inspected during 1954, and the average number of inspections per active small underground mine was 1.1 (table 1 and table 3).

d. 1,498 of the 1,570 active coal mines employing 15 men or more underground (Title II mines) were inspected during 1954, and the average number of inspections per active larger underground mine was 2.5 (table 1 and table 3).

e. 517 of the 1,275 active strip mines were inspected during 1954, and the average number of inspections per active strip mine was 0.4 (table 1 and table 3).

f. The average time required to make a regular inspection and to prepare the inspection report, including travel time, was 1.6 days for strip mines, 1.8 days for Title I underground mines, and 4.6 days for Title II mines, excluding special inspections (table 4). The average total time to complete an inspection of a Title II mine, including special inspections, is 5.4 days (table 5).

g. 2,727 special inspections required under Title II were made to determine whether violations cited under Sec. 203 had been abated. This represents an average of 0.7 special inspection and 0.8 additional man-day inspecting for each regular inspection of a Title II mine (table 5).

During 1954 Federal inspectors reported 91,517 violations of the Federal Mine Safety Codes while inspecting 4,810 Title I mines, an average of 19 violations per Title I mine inspected (see Appendix F). Thirty-nine percent of the inspection reports on these mines transmitted indicated dangers of a serious nature that were not corrected (see Appendix C), and only 16 percent of all the violations reported were corrected (see Appendix G).

Federal inspectors reported 30,113 violations of the Federal Mine Safety Codes while inspecting 1,498 Title II mines, an average of 20 violations per Title II mine inspected (see Appendix F). Eleven percent of the inspection reports on these mines transmitted indicated dangers of a serious nature that were not corrected (see Appendix C), and 52 percent of the violations of the codes were corrected (see Appendix G).

In all, 8,012 violations of the mandatory mine safety provisions of Title II of the Federal Coal Mine Safety Act were observed while making 3,894 inspections

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of these mines during 1954, an average of 2.1 per inspection. However, 5,079 (63 percent) of these violations were corrected before the inspections were completed, and 2,933 original notices (Form B) were issued at 943 mines granting reasonable time to abate violations that required more time to correct. Subsequent special inspections revealed that 2,955 violations had been totally abated, and 652 notices (Form C) were issued granting additional time for abatement of others. About 95 percent of the violations for which notices were posted were being abated at the expiration of the time originally set or the time as extended. Fifty-eight withdrawal orders citing imminent dangers under Sec. 203(a) (Form A) were issued at 43 mines during 1954, making a total of 98 such orders at 72 mines since July 16, 1952 (see Appendix B, table 1 and table 2, for imminent dangers cited by States). Seventy-six withdrawal orders under sec. 203(c) (Form D) were issued at 38 mines during 1954 for failure to abate violations within a reasonable time, making a total of 227 such orders at 110 mines since July 16, 1952 (see Appendix B, table 1 and table 3, for violations cited). Eighteen orders (Form B-1) were issued classifying mines gassy under Sec. 203(d) during 1954, making a total of 84 of such orders issued since July 16, 1952 (see Appendix B).

No violations of the Federal Mine Safety Codes were observed while inspecting 24 Title I mines and 65 Title II mines (see Appendix F), and violations of Sec. 209 of the Federal Coal-Mine Safety Act were not observed while inspecting 554 Title II mines (see Appendix B); 53 of these mines were free of violations of the codes and the act. These mines are identified in tables 1, 2, and 3, Appendix H.

The Federal Coal Mine Safety Act requires that the Director shall cause an inspection of each mine coming under the provisions of Title II to be made by a duly authorized representative of the Bureau at least annually. However, it is believed essential that these Title II mines should be federally inspected at least three times a year, small underground mines not covered by Title II should be inspected at least twice a year, strip mines should be inspected once a year, and spot-check inspections should be made (between regular inspections) at those mines where experience indicates lack of compliance with the provisions of the act. These minimum requirements are desirable because the provisions of Title I of the act are purely recommendatory, and Title II contains no penalties for noncompliance with its mandatory characteristics between inspections.

In addition to meeting the foregoing mine-inspection schedule, Federal inspectors are required to perform special duties, such as investigating fatal accidents and nonfatal, serious roof-fall accidents, making dust surveys, reviewing reports, working in supervisory capacities, assisting with rescue, recovery, and investigative work after mine disasters, teaching the Bureau's accident-prevention classes, and various other jobs. These special assignments are quite essential to comply with the provisions in the Federal Coal Mine Safety Act and to obtain the greatest benefits from the regular inspections.

A tabulation of the force of inspectors employed on December 31, 1954, is given in Appendix I.

SPECIAL WORK ACCOMPLISHED

Although the routine inspections of coal mines and distribution of inspection reports are primary functions of personnel of the Division, it is realized that the effectiveness of the inspections is enhanced when mine supervisory personnel and mine workmen have enough technologic and practical knowledge of modern concepts of coal-mine safety to recognize an unsafe condition or practice when it exists or is

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developing and know how to correct it. The opportunity to obtain such knowledge through the Bureau of Mines was not available generally before 1947, principally because funds were not made available for conducting the necessary training.

The need for providing this opportunity is recognized in section 106 of the Federal Coal Mine Safety Act, which authorizes and directs the Secretary of the Interior, acting through the Bureau of Mines, to expend the funds made available to him to advance health and safety in coal mines and prevent or relieve accidents and occupational diseases in mines in such lawful manner as he may deem most effective in the light of the information obtained under the act to accomplish the object for which such funds are granted.

To comply with such directive, the outstanding special work accomplished during 1954 is described hereafter. A tabulation of miscellaneous special work is included in Appendix J of this report.

Coal-Mine Accident Prevention Course for Miners

The National Bituminous-Coal Wage Agreement provides that:

> At each mine there shall be a Mine Safety Committee selected by the local union. The Mine Safety Committee may inspect any mine development or equipment used in producing coal. If the Committee believes conditions found endanger the life and bodies of the mine workers, it shall report its findings and recommendations to management. In those special instances where the Committee believes an immediate danger exists and the Committee recommends that management remove all mine workers from the unsafe area, the operator is required to follow the recommendation of the Committee.

The Anthracite Wage Agreement provides that:

> Mine Committees, acting on the request of individual employees or upon their own personal knowledge, shall have the right to report to management unsafe conditions affecting operations or equipment. In such cases, the Mine Committees shall have the right, accompanied by representatives of management, to make necessary inspections of property or equipment for the ascertainment of actual facts. In the event such conditions, when reported, are not satisfactorily corrected, the Mine Committee shall request action by the State and Federal inspectors.

To assure that members of these committees would be well versed in the provisions of the Federal Mine Safety Codes and thereby be better equipped to recognize unsafe conditions and practices that exist or are developing and to learn the proper means of overcoming them, the Bureau of Mines, in cooperation with the United Mine Workers of America, inaugurated a Coal-Mine Accident-Prevention Course for Mine Safety Committeemen in January 1947. The course covers the practical and some technical aspects of modern principles of coal-mine safety and requires 20 hours of classroom work. It had such an enthusiastic endorsement by mine safety committeemen and mine operators that it was decided to extend the enrollment opportunity to all mine workmen. The popularity of the training is attested by the record. From the time the revised training program was begun on Januray 1, 1947, to December 31, 1954, 107,690 mine safety committeemen and miners had completed the course. Included in these figures are 3,183 men who completed special on-the-job accident-prevention training, which was initiated at a large, eastern coal mine in

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February 1952. Usually the classes are conducted by Federal coal-mine inspectors who have been especially trained and authorized to carry on instructional work.

In addition, 1,697 have received specialized training in the maintenance, use, and limitations of permissible flame safety lamps to qualify them to make proper tests for gas in places where electric machines are operated in face areas in accordance with the provisions of Sec. 209 (d)(9) of the act.

Coal-Mine Accident-Prevention Course for Supervisors

Congress appropriated funds to continue the employment of mining engineers to train coal-mine supervisors in the modern principles of mine safety. The Bureau's Coal-Mine Accident-Prevention Course for Supervisors requires 40 hours of classroom instruction and covers all technoligic as well as practical phases of safety as applied to: Surface facilities; timbering and roof control; the transportation, storage, and use of explosives; ventilation and mine gases; coal dust and rock dust; haulage; electricity; safeguarding equipment; fire prevention and control; and other miscellaneous items. The course includes lectures, class discussions, actual demonstrations, and the use of visual aids, such as motion pictures, slides, and blackboard sketches.

This training program has been successful, and from March 1948 when the revised course was first offered to December 31, 1954, 19,310 coal-mine supervisors and others aspiring to such positions completed the training.

Electrical Safety Course

An outline for a course in electrical safety entitled "Electrical Fundamentals and Principals for Coal-Mine Electricians and Supervisors" was prepared by personnel of the Division, and initial training in the industry was begun in 1954. To date 49 coal-mine personnel, 9 State inspectors, and 15 Federal inspectors have completed the course in Alabama. Other classes are in progress in other States, and this worthwhile program is being expanded rapidly.

The Holmes Safety Association

Coal-mine-inspection personnel take an active interest in the Holmes Safety Association, which has been sponsored by the Bureau of Mines since 1926, when it was adopted as part of the Bureau's safety educational program to promote health and safety in the mineral industries through the cooperative efforts of management and labor and State and Federal agencies. In 1954 the Bureau began to intensify its efforts to expand operations of this organization to mining areas in all parts of the United States and is having success. This stepped-up program is being conducted by specially trained Division of Coal-Mine Inspection personnel in the coal-mining areas.

Experience has proved that injury rates are lower than average in mines that have membership in this association.

Investigation of Fatal Coal-Mine Accidents

The Bureau of Mines has investigated major mine disasters since its inception in 1910 as part of its accident-prevention program, and the conclusions drawn from these investigations have been used as a basis for recommending measures to prevent recurrences. The Bureau also has investigated explosions and fires in which less

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than five or no lives were lost, but before 1950 it was not general practice to investigate fatalities resulting from occurrences other than mine fires or explosions. The Bureau has long recognized the need for a comprehensive study of fatal accidents, but the task was too great for the limited available personnel. On the basis of the improved rate at which fatalities were occurring in coal mines and the increases in inspection personnel provided by Congress in recent years, investigations of all fatal accidents have been made since February 10, 1950. In addition, investigations of all reported serious nonfatal roof-fall accidents are now being made as part of the nationwide campaign to prevent roof-fall injuries. A report of each investigation is prepared by the Federal inspector, and it is distributed to the same agencies and persons that ordinarily would receive copies of the regular coal-mine-inspection report. The report gives the facts about the accident, presents the inspector's conclusions regarding the cause, and includes appropriate recommendations for preventing similar occurrences.

The information in the reports covering the investigations of coal-mine fatalities that occurred during the calendar years since 1950 has been condensed and published annually. It is particularly useful to officials of coal companies and of the mine workers' organizations in planning accident-prevention programs; to safety directors, inspectors, instructors, and supervisors who need such information to carry out their duties more effectively; and to mine workers who must know the causes of accidents to be better able to prevent injury to themselves and their fellow workmen. The ultimate objective is to provide information that will be helpful in preventing accidents.

This is the first time in the history of coal mining that the Bureau of Mines or any other agency or person has assembled, on a nationwide basis, detailed reports on the investigations of all fatalities occurring in coal mines of the United States and Alaska.

Roof-Control Work

Accident statistics have indicated for years that falls of roof and coal cause more than half of the fatalities that occur in coal mines, and this record has challenged all the forces interested in improving the accident rates in the coal-mining industry. The Bureau of Mines has done a considerable amount of research on mine-roof control when funds were available, but as late as 1948 no person or agency produced any new or improved means of satisfactorily solving the problems presented by this No. 1 killer of mine personnel. The Bureau has realized that, to reduce coal-mine injuries to a greater extent it would be necessary to find better methods of roof control, and in 1948 the Bureau's efforts in that direction culminated in the general introduction in the coal-mining industry of a new means of roof control known as roof bolting. The basic principle involved is to prevent the initial sag in exposed roof strata by converting them into a rigid beam, with steel bolts set in holes drilled in the roof rock. The bolts must be installed as soon as the roof is exposed by the normal process of mining.

After enough experimental work was conducted to prove the practicability and safety of bolting under controlled conditions, the method was given wide publicity in Bureau of Mines publications and in the trade journals. To satisfy the demand of mine operators for the Bureau's suggestions for installing roof bolts and to assure that the method would not be condemned as a failure because of improper installations, the Bureau trained certain Federal coal-mine inspectors and engineers to qualify as expert consultants in roof bolting; these experts are now headquartered in coal-mining areas where their services are needed. Generally, the mine

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operators obtain the advice and recommendations of the Bureau experts before any bolts are purchased, and some States now require mine operators to obtain a permit from the State inspection agency before roof can be bolted. Such wise precautions have contributed much to the success of this new method of roof control.

Before roof bolting is adopted in any mine, the Bureau of Mines recommends the following procedure:

Controlled experiments to determine whether roof bolting is applicable should be made in conformance with the procedures that have been worked out by the Bureau of Mines. Bureau experiments are made under controlled conditions with auxiliary conventional supports during the initial experimentation. After a safe and economical method of bolting is determined, no deviation from this method should be made without undergoing a new experimental period. Also, if roof conditions change radically from those encountered during the initial experimental period, a new experimental period should be undergone.

Federal coal-mine inspectors observe roof-bolting procedures during their regular inspections of coal mines and report deviations from the established plans along with other substandard practices of roof support.

The attitude of mine operators toward roof bolting is described best by saying that, since 1948, when the method was generally introduced to the industry, roof bolts have been installed in 580 coal mines. They are used exclusively in a number of large mines; according to the records, when installed as recommended by the Bureau of Mines, roof bolts simply and effectively prevent falls of roof. The installations have not been made in enough mines to have a notable effect on the accident rates in the entire coal-mining industry. However, the use of roof bolts is expanding rapidly, and the success attained at mines where they are being used indicates what may be expected as their use becomes more general.

The introduction of roof bolting to the coal-mining industry marks another major contribution of the Bureau of Mines in its efforts to fulfill the primary objective of the Congress in establishing the Bureau in 1910 - to prevent accidents in the mineral industries.

Supplemental to the foregoing roof-control activities, a mining engineer has made a thorough study of the possibilities of using various protective coatings to prevent disintegration of roof rock, with special attention to health and fire hazards involved. This work has been completed, and a set of safety standards covering roof coating has been prepared for the use of Federal inspectors and the industry.

As a further means of reducing the incidence of roof-fall accidents, the Bureau of Mines initiated a Coal-Mine Roof-Control Course in May 1951. It consists of about 30 minutes to 1 hour of lecture and discussion and is presented to coal-mine officials and employees by Federal coal-mine inspectors, usually after inspection of a mine has been completed. The course is designed to impress upon mine personnel the need for more adequate roof-control measures and to make all concerned more roof conscious; it was introduced in the industry in July 1951, and from that time to December 31, 1954, 218,277 mine personnel completed the training.

Although systematic timbering, use of roof bolts, and training miners to be constantly alert to roof conditions have been effective in reducing fatalities, roof falls still cause over half of all coal-mine fatalities, most of these in the areas

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within 12 feet of the working faces where the stability of the newly exposed roof cannot be immediately determined. In an effort to provide a means to guard against these unforeseen dangers, the Bureau is arranging an intensified program of research and investigation to develop mobile or portable devices that can be readily advanced with the working faces to protect workmen in the critical face areas. Success in this endeavor would be an outstanding advance in safety for the industry.

Late in 1954 an intensive 1955 national campaign to prevent roof-fall accidents was organized. This movement was initiated by coal-mine labor and supported by management. To reach the objective, the cooperation of all agencies that can contribute to the success of such an endeavor has been enlisted. Such agencies include: The mine workmen; supervisory and management officials; State departments of mines; national and local coal associations; local, district, and international headquarters of the United Mine Workers of America; editors of publications serving the coal-mining industry; newspapers circulated in coal-mining areas; national, district, and local institutes or safety organizations serving the coal-mining industry; carriers of compensation insurance; district and local safety committees; and the Federal Bureau of Mines. The response has been spontaneous, and the Director has pledged the wholehearted support of the Bureau of Mines to do the spadework and keynote the campaign. Federal coal-mine inspectors are actively promoting this campaign through their contacts with the industry - in the mines and at safety meetings and other gatherings.

Coal-Mine-Haulage Safety Section

The Coal-Mine-Haulage Safety Section of the Division of Coal-Mine Inspection was established in December 1950 to: Reduce haulage accidents in coal mines by studying causes; further study the trend of modernization and its possible effect on safety records; establish job-safety training instruction for haulage employees based upon haulage safety fundamentals and accident experiences; conduct haulage-hazard surveys by trained personnel; and promote a safety campaign to reach all persons connected with coal-mine transportation.

In April 1951 a Coal-Mine-Haulage Safety Course was completed and introduced in the coal-mining industry. The course consists of lectures and illustrations with respect to haulage safety and is presented to mine personnel by the Federal coal-mine inspectors, usually upon the completion of an inspection. From April 1, 1951, to December 31, 1954, 122,170 coal-mine haulage employees, officials, safety committeemen, and others completed this course. In view of the comparatively few men employed in haulage operations at coal mines the number of trainees has been outstanding.

Additional activities of the section during the report period included:

1. The preparation of technical papers on coal-mine-haulage safety for publication and presentation at mining institutes.

2. Active participation in National Safety Council, American Standards Association, and American Mining Congress committees for improvement in transportation safety and efficiency.

3. Completion of a safety motion picture, The Shuttle-Car Operator.

4. Making available pertinent data relative to haulage accidents and safe practices to companies and organizations requesting such service.

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5. Completion of several haulage surveys at operating mines in the field.

Injury and Employment Data

One of the special duties of coal-mine inspectors and engineers of the Division is to enlist the cooperation of coal-mine operators in submitting to the Bureau of Mines reports on injury and employment statistics in compliance with Sec. 105 of the Federal Coal Mine Safety Act. If an operator needs instruction on how to fill out the proper forms, the inspector or engineer is prepared to give the advice needed. This work is done at the time the mine is being inspected and has resulted in the submission of more and better reports by mine operators.

Ventilation Surveys

Certain mining engineers of the Division of Coal-Mine Inspection are assigned to coal-mine ventilation studies, surveys, and research. Especially difficult ventilation problems are encountered in mines from time to time, and mine operators request the Bureau's assistance in solving them. Many of these studies require pressure surveys and technical calculations that the regular coal-mine inspectors usually are not equipped to make.

Explosives Surveys

Mining-explosives engineers of the Division conducted special investigations with respect to the storage, transportation, and use of explosives and blasting devices. Generally, such studies are made at the request of mine operators interested in improving the safety and economy of their operations.

The Bureau of Mines has advocated the exclusive use of permissible explosives or permissible blasting devices in coal mines for many years and has advised against the use of black blasting powder and dynamite, which have caused so many gas and dust explosions, with attendant heavy casualties. The mining-explosives engineers did a considerable amount of educational work, demonstrating to mine operators by performance tests in the mines that the use of permissible explosives is much safer than and as economical as black blasting powder. Through their efforts and the efforts of the regular coal-mine inspectors, dangerous black blasting powder has been rapidly disappearing from coal mines. The mandatory provisions of Title II ban storage, use, and handling of black blasting powder in mines coming under Title II coverage after January 16, 1953, and the mining-explosives engineers have, when requested, been of great assistance to coal-mine operators in making the required changeover to safer methods of breaking down the coal efficiently.

Electrical Surveys

The mining-electrical engineers and electrical inspectors of the Division conduct special technical investigations of electrical facilities and installations in coal mines, generally at the request of mine operators. The engineers also are assigned to cooperate with the industry in conducting research work on electrical apparatus with a view toward designing safer equipment. The electrical inspectors also advise and assist the coal-mine inspectors in making determinations of the status of permissible electrical face equipment as required by Sec. 209(f)(1) of t the Federal Coal-Mine Safety Act.

Considerable research was done in 1954 to develop an equivalent protective device to replace the frame-grounding conductor in trailing cables of mobile

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electrical equipment. The reduction of insulating materials in and increased rigidity of trailing cables necessitated by incorporating an additional conductor has caused many trailing-cable failures, some with disastrous results. Manufacturers of such equipment have been cooperating, and some experimental devices have been put in service in nongassy mines to determine their safety and efficiency.

Dust Surveys

From January 21-31, 1946, a course of instruction in the Determination and Control of Unhygienic Dusts was given by personnel of the Bureau's Health Branch to certain employees of the Divisions of Safety and Coal-Mine Inspection. The object of the training was to provide each main field station with a qualified man to determine the concentration of airborne dusts in coal mines and to cooperate with dust experts of the Division of Health in conducting such surveys.

The importance of dust control in coal mines is recognized by the mining industry, and the Bureau of Mines is continuing its research work on airborne mine dusts with the view toward collecting enough data to be used as a basis for determining the concentrations of certain dusts that are considered harmful from a health standpoint and to determine the method and type of facilities best suited for controlling dusts.

On October 2, 1953, a program was inaugurated to have personnel engaged in coal-mine inspection work collect information on airborne dust conditions and dust-control practices in each coal mine inspected and submit a detailed report thereon to the Chief of the Branch of Health Research to assist in assembling data to determine the extent that occupational disease hazards exist in the Nation's mines as a result of exposure of workmen to dust-laden atmospheres. This program has been completed, and a report thereon is being prepared by the Branch of Health Research.

In promoting the adoption of roof bolting the Bureau has been aware of the health hazard introduced by drilling holes in silica-bearing strata. In keeping with Bureau policy to see that proper equipment is available to the industry, Bureau of Mines Schedule 25, Procedure for Testing Dust Collectors for Permissibility for Use in Connection with Rock Drilling in Coal Mines, was approved January 23, 1952, and amended July 23, 1952. Many dust collectors have met these requirements and have been approved and are available for use in coal mines under Schedule 25.

In an effort to provide more efficient and economical means of preventing the propagation of dust explosions in bituminous-coal mines, an engineer of the Division has been assigned to determine the possibilities of devising through intensive research new and more practical, effective, and positive means of preventing the propagation of dust explosions underground than rock dusting; to conduct research in the development of more economical and efficient means of applying rock dust on mine surfaces; and to conduct research to find improved methods and equipment for dust sampling a coal mine to determine promptly whether or not rock-dust applications are adequate. Beneficial results of this program are to be made available to the coal-mining industry.

Dust Explosions in Coal-Preparation Plants

Following several violent dust explosions in coal-preparation plants using thermal driers, the Bureau began a widespread investigation in 1954 to determine

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the causes of and present recommendations to prevent fires and explosions caused by "puffs" and "flashbacks" in such plants. This investigation is continuing.

Conveyor-Belt Fires

Following a meeting in Washington in 1954 of representatives of the State Inspection Departments, coal operators, mine workmen, manufacturers, the Bureau of Mines and other interested agencies, a committee was appointed to investigate the causes of belt fires in underground conveying systems and to recommend means of preventing such fires, including flame-resistant belts. Extensive research along this line is being carried on by Bureau personnel at the Pittsburgh Experiment Station.

Study of Natural-Gas Re-Storage Areas in Coal Fields

Because the restorage of natural gas, some at pressures above the initial rock pressures, in the exhausted sands under active coal-mining areas and the installation of high-pressure gas-transmission lines overlying active coal-mining areas present potential gas-explosion hazards in the adjacent coal-bearing strata, considerable work has been done to chart and correlate the gas re-storage fields and the gas-transmission lines within the active coal-mining areas. Division personnel cooperated with coal-mine operators and appeared before legislative committees to assist in formulating legislation to protect coal-mine workmen and mining properties.

Participation in Safety Organizations

Members of the Division of Coal-Mine Inspection take an active part in the National Safety Council, its various affiliated regional organizations, the Mine Inspectors' Institute of America, the National Mine Rescue Association, the American Mining Congress, and other national, regional, and local safety organizations throughout the United States by serving as officers and on committees and participating in the various programs.

The chief of the Division serves as secretary of the Coal-Mining Section, National Safety Council, and is editor of the Section's Monthly News Letter.

Cooperation With Other Federal Agencies

In response to requests from other Federal agencies, members of the Division of Coal-Mine Inspection have accepted special assignments to: Colombia; Austria; Korea; Venezuela; and India. All of these missions have been completed.

Such assignments of engineers and inspectors serve a twofold purpose: (1) The agency to which the Bureau experts are loaned receives the benefit of their wide experience in mining, and the experts add to their fund of knowledge; and (2) the information obtained through such special work is made available to the mining industry if such action is deemed in the public interest.

Members of the Division of Coal-Mine Inspection cooperate with the Wage and Hour and Public Contract Divisions, United States Department of Labor, in administering the Public Contracts section of the Walsh-Healy Act. Under the cooperative arrangement, the Bureau of Mines field office promptly notifies the local regional office of the Wage and Hour and Public Contracts Divisions if disaster or serious hazards are found by Federal coal-mine inspectors at Title I mines under contract

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to furnish coal to the Federal Government. When disaster or serious dangers are reported, employees of the U. S. Department of Labor require the mine operator to eliminate the dangers or face cancellation of the contract.

Revision of State Coal-Mining Laws

Since 1947 the Division of Coal-Mine Inspection has assisted in preparing proposed revisions of the coal-mining laws of 12 States.

The safety-regulations sections of the proposed revisions were designed along the lines of the Federal Mine Safety Codes, thus assuring more modern and standardized State coal-mining laws, and they have been adopted substantially as written in Alabama, Colorado, Maryland, Montana, Tennessee, and Wyoming. Proposed revisions of such laws for Arkansas, Illinois, Indiana, Kentucky, Ohio, and Oklahoma were prepared but either were not enacted or not introduced in the legislature.

The Bureau of Mines will continue to furnish this service to any agencies directly concerned with improving State mining laws, such as labor organizations, coal operators' associations, and State officials.

This contribution toward the reduction of injuries in coal mines is another major and vitally important step taken by the Bureau to fulfill its obligations to the coal-mining industry.

First-Aid and Mine Rescue Training

Personnel of the Branch conducted first-aid and mine rescue training for coal-mine personnel. During 1954, 13,961 persons completed the course in first aid, and 589 persons completed the mine rescue training.

Miscellaneous Special Assignments

A breakdown of the miscellaneous special assignments completed during 1954 is given in Appendix J.

ACHIEVEMENTS

This report covers the 2d full calendar year of inspection of coal mines under the Federal Coal Mine Safety Act and the 13th full calendar year of Federal coal-mine inspection work. The effectiveness of the work done by all concerned in fulfilling the principal purpose of Federal inspections - the reduction of accidents in coal mines - is revealed in part by comparing the injury records attained during equal 10-year periods before and after 1941, when the law became effective. The injury records for the calendar years 1952-54 are also given to build up a new 10-year period.

During the 10 years before Federal inspection of coal mines the fatality frequency rate per million man-hours of exposure in anthracite mines of Pennsylvanie was 1.61, and the nonfatal frequency rate 105.94. During the next 10 years under Federal inspections, the fatality rate was 1.11, and the nonfatal rate was 80.19. During the subsequent 3-year period, 1952-54, the fatality-frequency rate dropped to 1.03. Nonfatal figures for this period were incomplete at this writing.

During the 10 years before Federal inspection of coal mines the fatality frequency rate in bituminous-coal mines was 1.48 and the nonfatal frequency rate

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65.81. During the next 10 years, under Federal inspections, the fatality rate was 1.18 and the nonfatal rate 55.58. During the subsequent 3 years, 1952-54, the fatality frequency rate dropped to 0.90. (See table 1, Appendix K, for details.)

A record of the number of fatal and nonfatal injuries, by calendar years, that have occurred in the coal mines of the United States since 1932 is shown in table 2 of Appendix K. Preliminary figures indicate that the number of fatalities dropped from 460 in 1953 to 395 in 1954, but the frequency rate increased from 0.84 in 1953 to 1.01 in 1954. The 1953 accident record is the best in the history of the coal industry. Nonfatal figures for 1954 are incomplete. Whereas Title II of the Federal Coal Mine Safety Act was designed to prevent major disasters in coal mines employing regularly 15 or more persons underground and provided enforcement authority to attain this end, the results of operation under the act apparently extended beyond the scope thereof by stimulating generally the safety efforts of the entire industry during the 2-1/2-year period since its enactment.

The number of major coal-mine disasters in the United States and the fatalities resulting from them are listed for each year since 1931 in table 3 of Appendix K. A major disaster is defined as any accident that causes the death of five or more persons. Two major coal-mine disasters have occurred since the effective date of the Federal Coal-Mine Safety Act. The first of these, which caused the death of five men in 1953, was the result of a coal-dust explosion initiated by a blownout charge of black blasting powder in an Iowa mine. A temporary restraining order issued by a State court prohibited Federal inspectors from enforcing the ban on the use of black blasting powder as provided for in the Federal Coal Mine Safety Act. The other, in November 1954, killed 16 men, 1 on the surface and 15 entombed underground, when a violent explosion followed by a roaring mine fire necessitated sealing the mine surface openings to smother the fire before recovery operations could proceed.

Table 4, Appendix K, gives a comparison of the underground fatality frequency experience in Title I and Title II mines for 1951 through 1954.

Major improvements made in coal mines during the past 13 years contributed much to the favorable decrease in the injury rates. The records show that since December 1941 a systematic roof-support plan has been adopted in 2,475 mines; the use of dangerous black powder was discontinued in 1,624 mines; new main fans were installed at 2,919 mines; auxiliary blower fans with tubing were removed from 586 mines; preshift examinations for gas and other dangers were begun in 3,146 mines; onshift examinations for gas were begun in 2,236 mines; the use of water to allay dust was initiated in 1,028 mines; 1,868 mines were rock-dusted for the first time; second-openings were provided in 936 mines; regulations against smoking were adopted in 1,679 mines; and the use of open lights was discontinued in 1,482 mines. (See Appendix L for details.)

The favorable results attained during the past 13 years are not due to the efforts of any one group or agency, but it is well known in mining circles that Federal coal-mine inspection activities have been, and continue to be, a great influence in giving deserved attention to health and safety in coal mines. The Bureau has striven, with success, to have management and labor work hand-in-hand to iron out their safety and health problems. It is the cooperative efforts of management, labor, State inspection agencies, manufacturers of mining equipment, coal operators' associations, the Federal Bureau of Mines, and other agencies interested in mine safety that have brought about the improvements in conditions and practices that have resulted in continuing reduction in coal-mine injuries.

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RECOMMENDATIONS FOR LEGISLATIVE ACTION

It is evident that many hazards that might lead to disasters are being eliminated in the mines that come within the scope of the mandatory provisions of the Federal Coal Mine Safety Act, but much more can be accomplished if the enforcement powers afforded the Federal inspectors were expanded to cover most of the smaller mines - those employing less than 15 men underground - which as a group are poorly regulated. This is born out by the fact that 39 percent of the inspection reports on these mines indicated serious hazards that were not corrected promptly and only 16 percent of all the dangerous conditions reported were being corrected during the period covered by this report. (See Appendix C and Appendix G.) In addition, the underground fatality-frequency rate for mines employing 14 or less men underground, Title I mines, was 4.22 during 1954 compared with 1.01 for mines employing 15 or more men underground, Title II mines. These data are given in Appendix K, table 4.

PUBLICATIONS

The following Bureau of Mines publications, issued during 1954, were prepared wholly or partly by personnel of the Coal-Mine Inspection Branch:

Publication		Title	Authors
HSS	426	Fatalities at Pennsylvania Anthracite Mines, 1953	J. V. Mather
HSS	425	Haulage Fatalities in Bituminous-Coal Mines	D. S. Kingery
HSS	427	Falls of Roof, The No. 1 Killer at Bituminous-Coal Mines	
M.C.	35	Protection Against Mine Gases (1954 Revision)	W. Dan Walker, Jr., and A. E. Morrow
M.C.	49	Accidents from Hoisting and Haulage in Bituminous-Coal Mines - Coal-Mine Accident-Prevention Course, Section 3	D. S. Kingery
M.C.	59	Electrical Accidents in Bituminous-Coal Mines - Coal-Mine Accident-Prevention Course, Section 6	C. L. Brown
I.C.	7678	Roof Bolting in Alabama Coal Mines and Iron-Ore Mines	H. C. Young
I.C.	7685	Administration of the Federal Coal Mine Safety Act	James Westfield, H. F. Weaver, and C. M. Keenan
I.C.	7694	It Couldn't Happen (a description of five unusual fatal accidents)	D. S. Kingery
I.C.	7701	Recommended Standards for Installation and Maintenance of Haulage Roads	T. F. Curry and D. S. Kingery

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Publication	Title	Authors
I.C. 7703	Testing for Methane in Out-of-Reach Places	M. L. Davis
I.C. 7708	Coal-Mine Hazards From Overlying Gasoline Pipelines. Descriptions of Gasoline Explosions in Two Pennsylvania Bituminous-Coal Mines	W. Dan Walker, Jr., J. H. Dumire
FSC	Federal Mine Safety Code for Bituminous-Coal and Lignite Mines in the United States. Part I - Underground Mines, October 8, 1953	
FSC	Federal Mine Safety Code for Bituminous-Coal and Lignite Mines in the United States. Part II - Strip Mines, October 8, 1953	

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APPENDIX A

Office of the Director A.O. 695

UNITED STATES
DEPARTMENT OF THE INTERIOR
Bureau of Mines
Washington 25, D. C.

December 8, 1954

ADMINISTRATIVE ORDER 695

SUBJECT: Part A - Reorganization of Health and Safety Activities

Part B - Delegation of authority to District Health and Safety Supervisors, Chief, Branch of Health Research, and Chief, Branch of Electrical-Mechanical Testing

PART A

1. The Administrative Assistant Secretary of the Interior, on November 2, 1954, approved the reorganization of the Health and Safety Activities and authorized the Bureau to "proceed with the implementation job necessary to put this organization into effect." The new organization is consistent with the Management Survey Team Report on the Bureau of Mines.

In accordance with the authority quoted above from the Administrative Assistant Secretary, the following changes effective at the beginning of the next pay period (December 19, 1954) are hereby made in the Health and Safety Activities:

GENERAL

.1 Purpose. The nationwide activities of the Bureau of Mines concerned with health and safety in the mineral industries, including education, coal mine inspection, accident statistics, rescue and recovery operations, roof control activities, and mine-fire control projects are carried out through the Office of Assistant Director for Health and Safety. Health research, mining equipment testing and analyses, and educational motion picture activities are also conducted within the Office.

.2 Composition. The Office is composed of headquarters organization in Washington, D. C., and eight district offices, with subdistrict offices thereunder. These offices operate independently of the regional organization of the Bureau, except for administrative services, which are provided by the staffs of the Washington office, Region III, and Region V.

HEADQUARTERS ORGANIZATION

.3 Assistant Director for Health and Safety. The Assistant Director for Health and Safety, subject to the direction of the Director, supervises and coordinates the activities of the Office, and is responsible to the Director for

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developing broad objectives, formulating programs, and determining standards of operations. He aids the Director in administering the Federal Coal Mine Safety Act. Staff assistance to the Assistant Director is provided through technical assistants in his immediate office and three divisions, one of which is also responsible for certain centralized operations.

.4 Division of Coal Mine Inspection. The Division of Coal Mine Inspection provides staff assistance in formulating programs for the Assistant Director for Health and Safety, and also basic policies and standards to guide district field offices in carrying out nationwide programs of health and safety inspection and education in the coal-mining industry. It performs these functions by means of field inspections, review of reports, and evaluation of operations based on such inspections and review. The Division also assists the Assistant Director in administering the Federal Coal Mine Safety Act which is designed to prevent major disasters, promote health, and improve safety in coal mines.

.5 Division of Health. The Division of Health provides staff assistance in formulating programs and basic policies in regards to health activities in the mineral industries; including recognition and control of harmful or hazardous exposures, improvement of hygienic conditions, hygienic aspects of exposure to dusts, fumes, and gases in connection with the mining, preparation and utilization of minerals substances; also, investigation of atmospheric health hazards and ventilation requirements necessary to their control at mines and plants and in connection with industrial equipment; formulation of standards of allowable concentrations of atmosphere contaminants; development of standards and schedules under which respiratory protective devices and gas-detection devices are tested and approved for safe use in mineral industries; analysis of air and gas samples taken in connection with safety inspection of mines and plants, and the testing of respiratory protective devices for permissibility.

A. The Branch of Health Research. Located at Pittsburgh, Pennsylvania, the Branch of Health Research conducts research and testing as required to carry out the program of the Division, which is above described. Research and analytical activities for the western district offices are conducted at Denver, under the supervision of this Branch.

.6 Division of Safety. The Division of Safety provides staff assistance for plans and coordination of the Bureau's programs concerned with safety and education in the mineral industries, other than coal, on accident statistics, rescue and recovery operations after mine fires and explosions, and for roof control work in both the coal and metal-mining industries and control of underground and outcrop fires in inactive coal deposits. The Division plans and formulates programs for investigating safety conditions in the mineral industries and makes public reports on these conditions, with recommendations for eliminating hazards; recommends assignments of activities to the field offices to carry out approved programs, establishes standards of performance by the field offices, prepares progress reports to reflect performance, and, after analysis of these reports, recommends to the Assistant Director action necessary to strengthen and improve field operations. Provides consultative services to Government agencies and to industry and labor groups on accident statistics.

A. The Branch of Accident Analyses. Collects data on, and conducts analytical studies of, frequency, severity, location, cause, and other factors pertaining to fatal and nonfatal injuries in the mineral industries, and publishes statistics thereon. It provides basic accident data in connection with,

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and conducts, the annual safety competitions in the mineral industries. The Branch also collects and publishes data on the consumption of explosives used in the mineral industries.

B. The Branch of Electrical-Mechanical Testing. Located at Pittsburgh, Pennsylvania, is responsible for conducting research in the various factors affecting safety of life and property in the design, installation, and use of equipment and electrical circuits in mines and plants of the mineral industries and in installations of Government defense agencies. It performs similar activities in connection with diesel-driven equipment in mines, including approval testing of such equipment. The Branch cooperates with manufacturers, management, and labor in improving the safety design of mining equipment.

FIELD ORGANIZATION

.7 District Offices. There are eight district offices, each under the direction of a District Health and Safety Supervisor who is responsible directly to the Assistant Director for Health and Safety. Each district office carries on within its geographic area the approved inspection, education, and other related programs, through planning, directing, and reviewing the work of its staff engineers, coal mine inspectors, safety workers, and instructors. The district office serves as principal program administrator of the Federal Coal Mine Safety Act, and carries out health and safety educational and first-aid training operations. Mine-fire control work is conducted in Districts A, B, and H; however, such work within the geographic area of District A is conducted by the Anthracite Research Laboratory at Schuylkill Haven, Pennsylvania and reports to the headquarters office in Washington, D. C. Administrative services for District A and Schuylkill Haven, Pennsylvania are provided by the Administrative Division of the Bureau headquarters organization at Washington, D. C.; for Districts B, C, D, E, F, and G, by the Administrative Division, Region V, Pittsburgh, Pennsylvania; and for District H, by the Administrative Division, Region III, Denver.

.8 Subdistrict Offices. To assist the District Health and Safety Supervisor in carrying out the programs of his geographic area, also, in order to locate health, safety, and coal mine inspection personnel near the actual field of operations there are subdistrict offices, each under the direction of a Subdistrict Health and Safety Supervisor, who reports to the District Health and Safety Supervisor.

.9 Location of Field Offices. The boundaries and headquarters of the district offices and the location of subdistrict offices thereunder, with Mine Fire Control and certain Coal Mine inspection responsibilities are indicated below:

District A: Pennsylvania (east of a north-south line through Harrisburg), Maine, New Hampshire, Vermont, Massachusetts, New York, Rhode Island, Connecticut, Delaware, and New Jersey.
Headquarters: Wilkes-Barre, Pennsylvania.
Subdistrict Office: Albany, New York.
Mine Fire Control operations for District A are conducted by the Anthracite Research Laboratory, Schuylkill Haven, Pennsylvania.

District B: Pennsylvania (west of a north-south line through Harrisburg, Pennsylvania), Ohio, and the West Virginia counties of Marshall, Ohio, Brooke, and Hancock.

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Headquarters: Pittsburgh, Pennsylvania.
Subdistrict Offices: Johnstown, Pennsylvania; St. Clairsville, Ohio.
This district is responsible for Mine Fire Control operations in Districts B, C, D, and E.

District C: West Virginia (except the counties of Marshall, Ohio, Brooke and Hancock), Maryland, Virginia, and that portion of Kentucky east of a line extending south from the Indiana-Ohio boundary through Frankfort, Kentucky, to Tennessee.
Headquarters: Mt. Hope, West Virginia.
Subdistrict Offices: Morgantown, West Virginia; Norton, Virginia; and Barbourville, Kentucky.

District D: North Carolina, South Carolina, Georgia, Florida, Alabama, Mississippi, and Tennessee.
Headquarters: Birmingham, Alabama.
Subdistrict Office: Jellico, Tennessee.

District E: Indiana, Illinois, portion of Kentucky (west of a line extending south from the Indiana-Ohio boundary through Frankfort, Kentucky, to Tennessee), Missouri, and Iowa.
Headquarters: Vincennes, Indiana.

District F: North Dakota, South Dakota, Nebraska, Minnesota, Wisconsin, and Michigan.
Headquarters: Duluth, Minnesota.

District G: Texas, Oklahoma, Kansas, Arkansas, and Louisiana.
Headquarters: Dallas, Texas.
Subdistrict Office: McAlester, Oklahoma.

District H: Colorado, Arizona, New Mexico, Washington, Idaho, Montana, Oregon, Wyoming, California, Nevada, Utah, and the Territory of Alaska.
Headquarters: Denver, Colorado.
Subdistrict Offices: Anchorage, Alaska; Seattle, Washington; Salt Lake City, Utah; Phoenix, Arizona; and San Francisco, California. This district is responsible for Mine Fire Control operations in Districts F, G, and H; and, also, for Coal Mine Inspection in North Dakota and South Dakota.

II. The following principal officials in the Health and Safety Activities are hereby designated:

Assistant Director - James Westfield
Chief, Division of Coal-Mine inspection - Harry F. Weaver
Chief, Division of Health - James Westfield
Chief, Branch of Health Research - Lawrence B. Berger
Chief, Division of Safety - William J. Fene
Chief, Branch of Electrical-Mechanical Testing - Ernest J. Gleim
Chief, Branch of Accident Analysis - Seth T. Reese

The District Supervisors of Health and Safety are listed below:

Edward H. McCleary - District A
W. Dan Walker - District B
William R. Park - District C

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Milton C. McCall - District D
Eugene E. Quenon - District E
John A. Johnson - District F
George M. Kintz - District G
J. Howard Bird - District H

III. Revocations. (1) The present Health and Safety Division and its branches and sections headquartered at Washington, D. C. are hereby abolished and the personnel transferred to other units.

(2) The present Accident-Prevention and Health Divisions in Regions I through VIII are hereby abolished and the present staff of those divisions are transferred for management purposes to the District offices which are established in this order.

(3) All authorities previously delegated to Regional Directors of Regions I-VIII, inclusive pertaining to the Health and Safety Activities are hereby revoked, except such administrative functions as are covered in Administrative Order 693 dated November 22, 1954.

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APPENDIX B

TABLE 1. - Details of inspection data - Title II mines - 1954

States	Title II mine inspections	Joint State-Federal inspections 1/	Violations Sec. 209 observed	Mines at which Form B notices were issued	Notices issued			Orders issued			Mines at which orders were issued		Mines free of violations of Title II	Title II mines inspected
					Form B (original)	Form C Violations abated	Form C Time extended	Form A 203(a)	Form D 203(c)	Form B-1 203(d)	Form A	Form D		
Alabama	107	0	40	9	30	30	6	0	2	1	0	1	28	42
Alaska	5	4	7	1	4	4	0	0	0	0	0	0	0	2
Arizona	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Arkansas	24	0	47	3	17	17	1	2	0	0	1	0	5	7
California ...	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Colorado	53	0	94	16	37	36	0	0	0	0	0	0	6	22
Georgia	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Idaho	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Illinois	167	0	340	48	136	151	34	11	5	3	7	3	33	63
Indiana	41	0	128	19	88	100	15	2	2	0	2	1	2	16
Iowa	13	0	1	1	1	1	0	0	0	0	0	0	6	7
Kansas	5	0	3	0	0	0	0	2	0	0	1	0	2	2
Kentucky	690	0	1,346	197	681	678	67	6	26	4	6	14	88	303
Maryland	7	0	5	1	1	1	0	0	0	0	0	0	1	3
Michigan	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Missouri	33	0	3	0	0	0	0	0	0	0	0	0	9	9
Montana	10	0	3	0	0	0	0	0	0	0	0	0	4	3
New Mexico ...	4	0	3	0	0	0	0	0	0	0	0	0	1	2
North Carolina	0	0	0	0	0	0	0	0	0	0	0	0	0	0
North Dakota..	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Ohio	127	0	218	28	74	75	11	0	0	1	0	0	5	46
Oklahoma	18	18	16	2	5	5	1	0	0	0	0	0	4	6
Oregon	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Pennsylvania (anthracite).	402	0	230	59	126	113	92	6	2	0	5	2	111	138
Pennsylvania (bituminous).	590	0	1,039	118	286	279	53	5	10	2	4	3	85	223
Tennessee	59	0	173	23	85	84	46	4	6	1	3	4	11	29
Texas	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Utah	55	0	80	8	11	10	1	0	0	0	0	0	13	20
Virginia	256	0	589	81	328	331	18	6	5	3	2	1	29	103
Washington ...	21	21	15	5	10	10	0	0	0	0	0	0	1	8
West Virginia.	1,190	0	3,602	324	1,013	1,029	307	14	18	3	12	9	108	437
Wyoming	17	17	30	0	0	1	0	0	0	0	0	0	2	7
Totals	3,894	60	8,012	943	2,933	2,955	652	58	76	2/18	43	38	554	1,498

1/ Included in Title II mine inspections.
2/ One order annulled by the Director.

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APPENDIX B (Con.)

TABLE 2. - Withdrawal orders issued under Sec. 203(a) for imminent danger, by States, July 16, 1952 - December 31, 1954

Conditions constituting imminent danger	Alaska	Arkansas	Colorado	Illinois	Indiana	Kansas	Kentucky	Oklahoma	Pennsylvania (anthracite)	Pennsylvania (bituminous)	Tennessee	Virginia	West Virginia	Total
Man-trip:														
Dangerous roof	1	-	-	2	-	-	-	-	-	2	3	9	7	24
Poor track and equipment	-	-	-	-	-	-	-	-	-	-	-	-	1	1
Man-hoist:														
Worn rope	-	-	1	-	-	-	-	-	-	-	-	-	-	1
Shaft partition and cages deteriorated	-	-	-	-	-	-	-	-	-	1	-	-	-	1
Mine fire:														
Active fire adjacent to producing area	1	-	-	-	-	-	-	-	1	-	-	-	1	3
Electric-arc hazards and accumulated coal and coal dust	-	1	-	1	-	-	3	-	-	-	-	-	-	5
Poor electrical installation	-	-	-	1	-	1	-	-	-	-	-	2	1	5
Loose coal, inadequate ventilation, open oil containers	-	-	-	-	-	-	1	-	-	-	-	1	-	2
Mine explosion:														
Excessive methane liberations	-	-	1	-	-	-	-	-	-	-	-	-	-	1
Methane and dust accumulations	-	-	-	3	1	-	-	1	-	-	-	-	1	6
Methane accumulations	-	-	-	1	-	1	-	-	10	-	-	-	1	13
Leak in surface gasoline line	-	-	-	-	-	-	-	-	-	1	-	-	-	1
Inadequate rock dusting	-	-	-	-	-	-	-	-	-	1	-	-	4	5
Coal-dust accumulations, no rock dust, and poor ventilation	-	1	-	6	-	-	-	-	-	-	-	2	6	15
Active mine fire	-	-	-	-	1	-	1	-	1	-	-	-	-	3
Black powder and inadequate rock dust	-	-	-	1	-	-	-	-	-	-	-	-	-	1
Explosion disrupted ventilation	-	-	-	-	-	-	-	-	-	1	-	-	1	2
Coal-dust stemming, no tests for gas, doors open	-	-	-	-	-	-	-	-	-	-	2	-	-	2
Inundation:														
Working under body of water	-	-	-	-	-	-	2	-	-	-	-	-	-	2
Advancing toward abandoned workings	-	-	-	-	-	-	-	-	1	-	1	1	-	3
Inflow of oxygen-deficient air	-	-	-	1	-	-	-	-	-	-	-	1	-	2
Total	2	2	2	16	2	2	7	1	13	6	6	16	23	98

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TABLE 3. - Withdrawal orders issued under Sec. 203(c) for failure to abate violations of Sec. 209, by States July 16, 1952 - December 31, 1954

Sections violated	Alabama	Arkansas	Illinois	Indiana	Iowa	Kentucky	Missouri	Ohio	Pennsylvania (anthracite)	Pennsylvania (bituminous)	Tennessee	Utah	Virginia	West Virginia	Total
209(c)	-	-	-	-	-	4	-	-	-	2	-	-	1	7	14
209(d)(1)	2	1	1	-	-	13	1	1	3	6	2	-	6	4	40
209(d)(6)	-	-	3	-	-	1	-	-	-	1	-	-	-	3	8
209(d)(8)	-	-	-	-	-	11	-	1	-	-	-	-	1	-	13
209(d)(9)	-	-	1	1	-	2	-	-	-	-	-	-	-	2	6
209(e)(1)	-	-	2	-	-	18	-	-	-	2	1	-	12	10	45
209(e)(3)	-	-	1	1	4	10	-	1	-	3	1	-	6	5	32
209(e)(4)	-	-	-	-	-	5	-	-	-	1	-	-	-	2	8
209(e)(5)	-	-	-	1	-	16	-	-	-	2	2	-	11	7	39
209(f)(1)	-	-	-	-	-	1	-	-	-	2	-	-	-	1	4
209(g)(1)	-	-	1	-	-	2	-	-	-	1	-	-	2	5	11
209(g)(5)	-	-	1	-	-	-	-	-	-	-	-	-	-	-	1
209(h)(2)	-	-	-	-	-	-	-	-	-	-	-	1	-	1	2
209(h)(5)	-	-	2	-	2	-	-	-	-	-	-	-	-	-	4
Total ...	2	1	12	3	6	83	1	3	3	20	6	1	39	47	227

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APPENDIX C

Data pertaining to serious hazards observed

State	Title I mines			Title II mines		
	Title I inspections	Serious hazard letters sent to State Agency	Percent of inspections revealing serious hazards	Title II inspections	Serious hazard letters sent to State Agency	Percent of inspections revealing serious hazards
Alabama	653	233	36	107	6	6
Alaska	3	1	33	5	0	0
Arizona	11	0	0	0	0	-
Arkansas	23	19	83	24	11	46
California	0	0	-	0	0	-
Colorado	257	27	11	53	0	0
Georgia	10	5	50	0	0	-
Idaho	1	0	0	0	0	-
Illinois	130	85	65	167	65	39
Indiana	82	41	50	41	8	20
Iowa	87	23	26	13	1	8
Kansas	16	6	38	5	4	80
Kentucky	1,083	448	41	690	43	6
Maryland	72	29	40	7	1	14
Michigan	0	0	-	0	0	-
Missouri	48	37	77	33	13	39
Montana	118	58	50	10	0	0
New Mexico	103	5	5	4	0	0
North Carolina.	0	0	-	0	0	-
North Dakota ..	21	1	5	0	0	-
Ohio	462	202	44	127	18	14
Oklahoma	25	12	48	18	5	28
Oregon	4	2	50	0	0	-
Pennsylvania (anthracite)..	650	53	8	402	16	4
Pennsylvania (bituminous)..	520	163	31	590	48	8
Tennessee	722	313	43	59	7	12
Texas	0	0	-	0	0	-
Utah	91	71	78	55	7	13
Virginia	738	507	69	256	13	5
Washington	19	9	47	21	1	5
West Virginia..	635	208	33	1,190	140	12
Wyoming	41	14	34	17	3	18
National data..	6,625	2,572	39	3,894	410	11

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APPENDIX D

Appeals to the Director under Sec. 206(c) and appeals to the Federal Coal Mine Safety Board of Review under Sec. 207
July 16, 1952 - December 31, 1954

Mine and company	Reason for appeal	Disposition by: Director	Board
Maxton Slope mine, Morrisdale Mining Co., Hawk Run, Pa.	Gassy classification 203(d).		Appeal denied 10/18/52.
Glenmar No. 1 mine, Moshannon-Smithing Coal Co., Beccaria, Pa.	do.	Appeal denied 12/31/52.	Appeal denied 2/24/53.
Ponfeigh Pine Hill mine, Ponfeigh Pine Hill Smokeless Coal Co., Garrett, Pa.	do.	Order annulled 3/2/53. Field investigation 12/8/52.	
Seaboard No. 1 mine, Rebecca Coal Co., Richlands, Va.	do.	Appeal denied 6/16/53.	Appeal made 7/8/53. Hearing 11/10-11/53. Annulled 12/3/53.
Carnegie mine, Clean Coal Co., Bellaire, Ohio	do.	Appeal denied (application not made within 20 days).	
Haws No. 7 mine, Haws Refractories Co., Johnstown, Pa.	do.	Appeal denied 8/10/53.	
Kleaner No. 1 mine, Kleaner Coal Co., Bokoshe, Okla.	Imminent explosion danger.		1/Appeal made 9/27/53. Hearing 10/2/53. Annulled 10/2/53.
Talleydale mine, Snow Hill Coal Corp., Terre Haute, Ind.	2/ Violation of Sec. 209(d)(9)	Order annulled 8/4/53.	Appeal made for temporary relief 6/5/53. Hearing 6/17/53- time extended for total abatement until 7/11/53.

1/ State-participation plan in effect.
2/ Failure to make tests for gas before electrical equipment taken beyond the last open crosscut.

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Mine and company	Reason for appeal	Disposition by: Director	Board
Princess No. 2, Princess Elkhorn Coal Co., Permele, Ky.	Gassy classification Sec. 203(d).	Order annulled 2/11/54.	
Do.	do.	Denied 10/15/54.	Appeal made 11/3/54. Hearing 11/30/54 and 12/10/54. Order annulled 1/28/55.
Cassity mine, Nos. 2, 3, and 6 openings, Three Fork Coal Co., Inc., Cassity, W. Va.	3/Violation of Sec. 209(e)(1).		Appeal made 12/13/54. Granted temporary relief through 1/17/55. Full hearing 1/17/55 to 1/20/55 granted temporary relief pending decision.

3/ Dangerous accumulation of loose coal and coal dust.

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APPENDIX E

TABLE 1. - Number of active coal mines in the Nation - 1954

State	Title I mines		Title I mines	Title II mines	Total mines
	Strip	Underground			
Alabama	20	383	403	42	445
Alaska	3	1	4	2	6
Arizona	0	4	4	0	4
Arkansas	3	15	18	7	25
California	0	0	0	0	0
Colorado	6	132	138	22	160
Georgia	0	9	9	0	9
Idaho	0	1	1	0	1
Illinois	44	83	127	83	210
Indiana	44	35	79	20	99
Iowa	29	33	62	7	69
Kansas	10	4	14	2	16
Kentucky	76	1,144	1,220	303	1,523
Maryland	15	44	59	4	63
Michigan	0	0	0	0	0
Missouri	11	24	35	9	44
Montana	35	47	82	3	85
New Mexico	7	47	54	2	56
North Carolina ..	0	0	0	0	0
North Dakota	22	3	25	0	25
Ohio	106	203	309	46	355
Oklahoma	11	13	24	6	30
Oregon	0	3	3	0	3
Pennsylvania (anthracite) ...	158	560	718	138	856
Pennsylvania (bituminous) ...	463	501	964	226	1,190
Tennessee	67	766	833	29	862
Texas	0	0	0	0	0
Utah	0	36	36	20	56
Virginia	20	793	813	103	916
Washington	4	8	12	8	20
West Virginia ...	110	607	717	481	1,198
Wyoming	11	16	27	7	34
Total	1,275	5,515	6,790	1,570	8,360

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APPENDIX E (Con.)

TABLE 2. - Number of regular inspections, surveys, and investigations of disasters and fatal accidents since 1941

Period	Field headquarters	Inspections			Surveys				Investigations of fatalities and disasters
		Original	Reinspections	Total	Electrical	Explosives	Ventilation	Dust	
1941-1953	All	13,430	48,617	62,047	223	248	29	40	2,143
1954	Anchorage	1	7	8	0	0	0	0	3
	Seattle	11	162	173	0	0	0	0	3
	Denver	8	351	359	12	0	0	0	3
	Salt Lake City	2	183	185	9	0	0	0	9
	Phoenix	8	80	88	0	0	0	0	0
	Duluth	12	109	121	0	0	0	0	0
	McAlester	7	185	192	1	0	0	0	1
	Birmingham	102	668	770	0	0	0	0	12
	Jellico	329	452	781	27	0	1	0	17
	Pittsburgh	47	429	476	14	0	1	0	41
	Johnstown	57	577	634	0	0	1	0	29
	St. Clairsville	115	510	625	1	0	0	0	13
	Morgantown	67	622	689	17	0	0	0	37
	Mt. Hope	184	995	1,179	14	0	0	0	109
	Norton	449	1,130	1,579	1	0	0	0	40
	Barbourville	296	724	1,020	5	0	0	0	39
	Vincennes	18	570	588	3	0	2	0	62
	Wilkes-Barre	275	777	1,052	0	0	0	0	101
Totals 1954		1,988	8,531	10,519	104	0	5	0	519
Grand Totals		15,418	57,148	72,566	327	248	34	40	2,662

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APPENDIX E (Con.)

TABLE 3. - Mines inspected, regular inspections, and average inspections per active mine - 1954

State	Mines inspected				Inspections made				Average inspections per active mine			
	A	B	C	Total	A	B	C	Total	A	B	C	Total
Alabama	20	313	42	375	32	621	107	760	1.6	1.6	2.5	1.7
Alaska	2	1	2	5	2	1	5	8	.7	1.0	2.5	1.3
Arizona	0	4	0	4	0	11	0	11	0	2.8	0	2.8
Arkansas	3	13	7	23	3	20	24	47	1.0	1.3	3.4	1.9
California	0	0	0	0	0	0	0	0	-	-	-	-
Colorado	4	132	22	158	4	253	53	310	.7	1.9	2.4	1.9
Georgia	0	6	0	6	0	10	0	10	-	1.2	-	1.2
Idaho	0	1	0	1	0	1	0	1	-	1.0	-	1.0
Illinois	40	58	63	161	40	90	167	297	.9	1.1	2.0	1.4
Indiana	39	29	16	84	39	43	41	123	.9	1.2	2.0	1.2
Iowa	25	30	7	62	25	62	13	100	.9	1.9	1.8	1.4
Kansas	10	4	2	16	10	6	5	21	1.0	1.5	2.5	1.3
Kentucky	37	828	303	1,168	38	1,045	690	1,773	.5	.9	2.3	1.2
Maryland	8	34	3	45	8	64	7	79	.5	1.5	1.7	1.3
Michigan	0	0	0	0	0	0	0	0	-	-	-	-
Missouri	10	21	9	40	10	38	33	81	.9	1.6	3.7	1.8
Montana	26	45	3	74	38	80	10	128	1.1	1.7	3.3	1.5
New Mexico	7	47	2	56	9	94	4	107	1.3	2.0	2.0	1.9
North Carolina..	0	0	0	0	0	0	0	0	-	-	-	-
North Dakota ...	19	1	0	20	19	2	0	21	.9	.7	-	.8
Ohio	106	199	46	351	106	356	127	589	1.0	1.8	2.8	1.7
Oklahoma	9	10	6	25	9	16	18	43	.8	1.2	3.0	1.4
Oregon	0	3	0	3	0	4	0	4	-	1.3	-	1.3
Pennsylvania (anthracite) ..	38	461	138	637	39	611	402	1,052	.2	1.1	2.9	1.2
Pennsylvania (bituminous) ..	23	352	223	598	23	497	590	1,110	.1	1.0	2.6	.9
Tennessee	56	576	29	661	59	663	59	781	.9	.9	2.0	.9
Texas	0	0	0	0	0	0	0	0	-	-	-	-
Utah	0	36	20	56	0	91	55	146	-	2.5	2.7	2.6
Virginia	0	604	103	707	0	738	256	994	0	.9	2.5	1.1
Washington	4	8	8	20	4	15	21	40	1.0	1.9	2.6	2.0
West Virginia ..	20	461	437	918	20	615	1,190	1,825	.2	1.0	2.5	1.5
Wyoming	11	16	7	34	14	27	17	58	1.3	1.7	2.4	1.7
National data ..	517	4,293	1,498	6,308	551	6,074	3,894	10,519	.4	1.1	2.5	1.3

A - Strip mines.
B - Title I underground mines.
C - Title II mines.

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TABLE 4. - Average man-days to complete regular inspections and reports

States	Title I mines				Title II mines		All mines	
	Strip		Underground					
	A	B	A	B	A	B	A	B
Alabama	1.0	0.4	0.8	0.5	3.6	0.5	1.2	0.5
Alaska	1.0	1.0	1.0	1.0	1.6	.6	1.4	.8
Arizona	-	-	1.3	.6	-	-	1.3	.6
Arkansas	2.0	1.0	1.7	1.1	3.3	1.1	2.6	1.1
California	-	-	-	-	-	-	-	-
Colorado	1.7	.7	1.2	.7	3.1	.8	1.6	.7
Georgia	-	-	.7	.5	-	-	.7	.5
Idaho	-	-	9.0	1.0	-	-	9.0	1.0
Illinois	1.5	.5	1.7	.7	5.3	.8	3.7	.7
Indiana	1.0	.5	1.2	.8	4.1	1.2	2.1	.8
Iowa	.8	.5	1.5	.7	1.2	.7	1.3	.6
Kansas	1.2	.7	1.7	.8	2.5	1.0	1.7	.8
Kentucky	1.1	.9	1.0	.8	2.8	.8	1.7	.8
Maryland	.6	.7	.6	.8	1.3	.9	.7	.8
Michigan	-	-	-	-	-	-	-	-
Missouri	1.6	.9	1.3	.8	2.0	.8	1.7	.8
Montana	.8	.4	.9	.6	2.8	1.0	1.0	.6
New Mexico	1.1	.5	1.0	.7	2.0	1.0	1.1	.7
North Carolina	-	-	-	-	-	-	-	-
North Dakota	1.7	.5	2.0	1.0	-	-	1.8	.6
Ohio	1.2	.8	1.1	.9	3.4	.9	1.6	.9
Oklahoma	1.0	.8	1.4	1.6	4.8	1.1	2.7	1.2
Oregon	-	-	2.0	.7	-	-	2.0	.7
Pennsylvania (anthracite)	.6	.5	1.0	.9	5.5	.9	2.7	.9
Pennsylvania (bituminous)	.9	.8	.9	1.1	4.3	1.1	2.7	1.1
Tennessee	.5	.5	.7	.7	3.7	1.0	.9	.7
Texas	-	-	-	-	-	-	-	-
Utah	-	-	1.1	.4	4.1	.5	2.2	.5
Virginia	-	-	1.0	.9	2.3	1.0	1.3	.9
Washington	1.0	.7	1.3	.6	3.9	.7	2.6	.7
West Virginia	1.0	.7	.8	.7	3.5	.8	2.6	.8
Wyoming	1.5	.6	1.1	.6	3.6	.6	1.9	.6
National data	1.0	.6	1.0	.8	3.7	.9	2.0	.8

A - Average days to complete regular inspection. Includes inspection, travel, preparing, and posting preliminary report or notices or orders, conference with mine personnel, and preparing notes and sampling cards.

B - Average days for inspector to prepare rough draft of final inspection report.

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TABLE 5. - Special inspections and average total time to complete inspection under Title II

Field Office	Special inspections	Man-days making special inspections		Regular inspections, Title II mines	Average additional man-days per regular inspection	Average man-days per regular inspection	Average total time per Title II inspection
		Total	Average per special inspection				
Anchorage	2	2	1.0	5	0.4	1.5	1.9
Seattle	7	21	3.0	31	.7	3.5	4.2
Denver	33	38	1.2	56	.7	3.1	3.8
Salt Lake City..	12	12	1.0	72	.2	3.9	4.1
Phoenix	0	0	0	1	0	.9	.9
Duluth	1	1	1.0	13	.1	1.2	1.3
McAlester	14	44	3.1	80	.6	3.1	3.7
Birmingham	30	31	1.0	107	.3	3.6	3.9
Jellico	100	79	.8	59	1.3	3.7	5.0
Pittsburgh	90	97	1.1	286	.3	4.8	5.1
Johnstown	169	177	1.0	304	.6	3.9	4.5
St. Clairsville.	70	59	.8	142	.4	3.6	4.0
Morgantown	173	171	1.0	317	.5	3.1	3.6
Mt. Hope	935	935	1.0	865	1.1	3.6	4.7
Norton	354	282	.8	468	.6	2.6	3.2
Barbourville....	297	249	.8	374	.7	2.8	3.5
Vincennes	267	273	1.0	312	.9	4.3	5.2
Wilkes-Barre ...	173	174	1.0	402	.4	5.5	5.9
National data inspection work	2,727	2,645	1.0	3,894	.7	3.7	4.4
Average time to write inspection report....							.9
Total average time Title II mine							5.3

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APPENDIX F

Violations of the Federal Mine Safety Codes

State	Title I mines				Title II mines			
	Mines inspected	Violations reported[1]	Average violations per mine inspected	Mines free of violations	Mines inspected	Violations reported[1]	Average violations per mine inspected	Mines free of violations
Alabama	333	7,267	22	1	42	300	7	12
Alaska	3	51	17	0	2	30	15	0
Arizona	4	34	9	0	0	-	-	-
Arkansas	16	545	34	0	7	204	29	0
California ...	0	-	-	-	0	-	-	-
Colorado	136	1,057	8	1	22	234	11	3
Georgia	6	149	25	0	0	-	-	-
Idaho	1	5	5	0	0	-	-	-
Illinois	98	1,272	13	0	63	1,272	20	0
Indiana	68	716	11	1	16	297	19	0
Iowa	55	884	16	0	7	126	18	0
Kansas	14	257	18	0	2	67	33	0
Kentucky	865	18,848	22	0	303	5,136	17	9
Maryland	42	1,130	27	0	3	88	29	0
Michigan	0	-	-	-	0	-	-	-
Missouri	31	698	23	0	9	220	24	0
Montana	71	428	6	9	3	15	5	1
New Mexico ...	54	289	5	1	2	17	8	0
North Carolina	0	-	-	-	0	-	-	-
North Dakota..	20	96	5	0	0	-	-	-
Ohio	305	7,151	23	1	46	1,127	25	0
Oklahoma	19	286	15	0	6	63	10	2
Oregon	3	20	7	0	0	-	-	-
Pennsylvania (anthracite).	499	4,682	9	4	138	1,244	9	7
Pennsylvania (bituminous).	375	6,443	17	3	223	3,610	16	14
Tennessee	632	12,194	19	0	29	719	25	0
Texas	0	-	-	-	0	-	-	-
Utah	36	433	12	2	20	209	10	3
Virginia	604	14,922	25	0	103	1,909	19	3
Washington ...	12	86	7	0	8	75	1	0
West Virginia.	481	11,383	24	0	437	13,067	30	9
Wyoming	27	191	7	1	7	84	12	2
National data.	4,810	91,517	19	24	1,498	30,113	20	65

1/ Includes all violations found during first inspections made during the year and all new violations found during subsequent inspections.

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APPENDIX G

Percent of compliance with recommendations of Federal inspectors on violations of the Federal Mine Safety Codes

State	7/1/51 to 6/30/52	7/1/52 to 12/31/52	1953		1954	
		Title I	Title I	Title II	Title I	Title II
Alabama	13	7	8	63	9	32
Alaska	26	0	17	62	9	60
Arizona	50	0	26	-	47	-
Arkansas	8	-	10	62	14	55
California	-	-	-	-	-	-
Colorado	50	35	53	62	55	75
Georgia	6	4	2	-	11	-
Idaho	-	-	-	-	0	-
Illinois	20	17	23	34	31	48
Indiana	23	22	25	40	31	52
Iowa	7	11	14	21	16	22
Kansas	10	2	16	52	19	33
Kentucky	25	7	12	40	11	38
Maryland	25	19	10	16	22	36
Michigan	27	-	-	-	-	-
Missouri	9	4	13	30	34	60
Montana	25	15	13	48	11	83
New Mexico	49	19	52	50	40	20
North Carolina	38	-	-	-	-	-
North Dakota	24	31	20	33	27	-
Ohio	19	16	22	40	26	60
Oklahoma	18	8	14	57	16	67
Oregon	32	-	9	-	14	-
Pennsylvania (anthracite)	29	17	14	39	18	51
Pennsylvania (bituminous)	37	29	24	56	29	70
Tennessee	14	9	9	38	8	56
Texas	-	-	-	-	-	-
Utah	47	27	33	90	47	77
Virginia	19	7	8	40	5	47
Washington	28	14	16	33	27	35
West Virginia	40	17	18	47	21	52
Wyoming	40	19	25	89	34	65
National average	27	13	15	46	16	52

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APPENDIX H

TABLE 1. - Title I mines at which no violations of the Federal Mine Safety Codes were observed during an inspection

1954		
State	Mine	Company
Alabama	Sayre[1/]	Republic Steel Corp.
Colorado	New Castle	New Castle Coal Co.
Indiana	St. Mary's	Sisters of Providence Coal Co.
Montana	Peuse[1/]	Gordon Peuse, Operator
Do.	Rosebud Open pit[1/]	Foley Bros., Inc.
Do.	Wolf Creek[1/]	T. W. and C. A. Danielson
Do.	Topp[1/]	Joseph Topp, Operator
Do.	Erickson[1/]	Theo. Erickson, et al, licensees and operators
Do.	Hanson[1/]	Perry Hanson, et al, licensees and operators
Do.	New Black Diamond	Ray Duncan, Lessee
Do.	Crow Rock	Fred Hout, lessee and operator
Do.	Brophy	Brophy Coal Co.
New Mexico	Speratos	Albuquerque and Cerrillos Coal Co.
Ohio	Bradford No. 1[1/]	The Hanna Coal Co.
Pennsylvania....	Pittshaw No. 15[1/]	Maral Co.
Do.	Pittshaw No. 16A[1/]	Do.
Do.	Pittshaw No. 85	Do.
Do.	No. 91 slope	Steve J. Bilko Coal Co.
Do.	Prospect colliery	Lehigh Valley Coal Co.
Do.	No. 1 slope	Springfield Coal Co.
Do.	No. 1 drift	Do.
Utah	Deseret	Deseret Coal Co., cooperative security
Do.	Book Cliffs	Book Cliffs Coal Co.
Wyoming	Blue Diamond[1/]	Blue Diamond Coal Co.

1/ Strip mines.

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TABLE 2. - Title II mines at which no violations of the Federal Mine Safety Codes were observed during an inspection

1954		
State	Mine	Company
Alabama	*Maxine	Alabama By-Products Corp.
Do.	*Labuco	Do.
Do.	*Gorgas No. 3	Alabama Power Co.
Do.	*Sayre	Republic Steel Corp.
Do.	*Sayreton No. 1	Do.
Do.	*Sayreton No. 2	Do.
Do.	*Hamilton	Tennessee Coal & Iron Division of U. S. Steel Corp.
Do.	*Docena	Do.
Do.	Short Creek No. 19	Do.
Do.	*Concord No. 1	Do.
Do.	*Edgewater	Do.
Do.	*Dolomite No. 3	Woodward Iron Co.
Colorado	*Eagle	Imperial Coal Co.
Do.	*Hawk's Nest	Champion Coal Mining Co.
Do.	*Morley	Colorado Fuel & Iron Corp.
Kentucky	*Hendrix	Consolidation Coal Co.
Do.	*No. 204	Do.
Do.	*No. 214	Do.
Do.	*Pond Creek	Norfolk & Western Railway (Fuel Dept.)
Do.	*Thacker No. 5	Do.
Do.	*Winifrede No. 2	Do.
Do.	*Republic No. 4	Republic Steel Corp.
Do.	*Republic D	Do.
Do.	*High Splint No. 1 Glenbrook colliery	Stonega Coke and Coal Co.
Montana	*Keene No. 2	Mountain States Mining Co.
Oklahoma	*Carbon No. 5	Lone Star Steel Co.
Do.	*McCurtain	Do.
Pennsylvania	*Bridgeport	U. S. Steel Corp.
Do.	*Collier	Do.
Do.	Foster #6 and 8	Leechburg Mining Co.
Do.	*Harwick	Duquesne Light Co.
Do.	*Indianola	Republic Steel Corp.
Do.	*Isabella	Weirton Coal Co.
Do.	*Karen	U. S. Steel Corp.
Do.	*Leisenring No. 2	U. S. Steel Corp.
Do.	*Leisenring No. 3	Do.
Do.	*Maxwell	Do.
Do.	Palmer	Do.
Do.	*Poland No. 1	Molnar Bros. Coal Co.
Do.	*Russellton	Republic Steel Corp.
Do.	*Springdale	Allegheny Pittsburgh Coal Co.
Do.	*No. 10 slope	Ardoline Coal Co.
Do.	*Kirmar slope	Biscontini and Sons Coal Co.
Do.	*No. 58 slope	Do.
Do.	*No. 1 slope	Newport Excavating Co.
Do.	*No. 2A slope	Do.

*Mines appear in both tables 2 and 3.

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APPENDIX H (Con.)

TABLE 2. - Title II mines at which no violations of the Federal Mine Safety Codes were observed during an inspection (Con.)

1954		
State	Mine	Company
Pennsylvania (Con.).	*No. 1A slope	Newport Excavating Co.
Do.	*Glen Lyon colliery	Susquehanna Collieries Division The M. A. Hanna Co.
Utah	*Sunnyside No. 2	Kaiser Steel Corp.
Do.	*Sunnyside No. 3	Do.
Do.	*Book Cliffs	Book Cliffs Coal Co.
Virginia	*Moss No. 2	Clinchfield Coal Corp.
Do.	*Moss No. 3	Do.
Do.	*Crossbrook	Stonega Coke and Coal Co.
West Virginia	*No. 3	U. S. Steel Corp., Coal Division
Do.	*No. 6	Do.
Do.	*No. 9	Do.
Do.	No. 10	Do.
Do.	*No. 3	Red Bird Mining Co.
Do.	*Huff Mountain	Redyard Coal Co.
Do.	Olga No. 1	Olga Coal Co.
Do.	Lake Superior No. 3	Lake Superior Coal Co.
Do.	*Hernshaw	Electro-Metallurgical Co.
Wyoming	Brilliant No. 8	The Kemmerer Coal Co.
Do.	*Peacock No. 12	Colony Coal Co.

*Mines appear in both tables 2 and 3.

TABLE 3. - Title II mines at which no imminent dangers (Sec. 203(a)) or violations of Sec. 209 under Title II were observed during an inspection

1954		
State	Mine	Company
Alabama	Bessie	U. S. Pipe & Foundry Co.
Do.	Blockton No. 9	Black Diamond Coal Mining Co.
Do.	Marvel No. 1	Cates Coal Co.
Do.	Marvel No. 3	Do.
Do.	New Banner No. 3	Davidson-Pratt Mining Co.
Do.	Dixie	Dixie Fire Brick Co.
Do.	Empire No. 3	DeBardeleben Coal Corp.
Do.	*Hamilton	Tennessee Coal & Iron Division of U. S. Steel Corp.
Do.	Kellerman No. 19	Twin Seam Mining Co.
Do.	*Maxine	Alabama By-Products Corp.
Do.	*Sayre	Republic Steel Corp.
Do.	American No. 5	Stith Coal Co.
Do.	*Docena	Tennessee Coal & Iron Division of U. S. Steel Corp.
Do.	*Dolomite No. 3	Woodward Iron Co.
Do.	*Labuco	Alabama By-Products Corp.
Do.	Moro No. 3	Moro Brothers Coal Co.
Do.	Praco	Alabama By-Products Corp.

*Mines appear in both tables 2 and 3.

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APPENDIX H (Con.)

TABLE 3. - Title II mines at which no imminent dangers (Sec. 203(a)) or violations of Sec. 209 under Title II were observed during an inspection (Con.)

1954		
State	Mine	Company
Alabama (Con.).....	*Sayreton No. 1	Republic Steel Corp.
Do.....	*Sayreton No. 2	Do.
Do.	Warrior River No. 4	Brookside-Pratt Mining Co.
Do.	Blue Creek	Black Diamond Coal Mining Co.
Do.	New Banner	Davidson-Pratt Mining Co.
Do.	Black Diamond Nos. 1 and 2	Black Diamond Coal Mining Co.
Do.	Bradford	Alabama By-Products Corp.
Do.	*Concord	Tennessee Coal & Iron Division of U. S. Steel Corp.
Do.	*Edgewater	Do.
Do.	*Gorgas No. 3	Alabama Power Co.
Do.	Thermal No. 1	Alabama By-Products Corp.
Arkansas	No. 1 mine	Dixie Fuel Co.
Do.	Quality No. 2	Quality Excelsior Coal Co.
Do.	Jewell mine	Jewell Mining Co.
Do.	Clarksville	Clarksville Coal Co.
Do.	Peerless No. 3	Peerless Coal Co.
Colorado	Somerset	Minerals Development Corp., Calumet Fuel Division
Do.	*Eagle	Imperial Coal Co.
Do.	Imperial	Do.
Do.	*Morley	Colorado Fuel and Iron Corp.
Do.	Harris	Colorado and Utah Coal Co.
Do.	*Hawk's Nest	Champion Coal Mining Co.
Illinois	Schubert No. 1	Schubert Coal Co.
Do.	Glenridge	Marion County Coal Mining Corp.
Do.	Eddy	Eddy Coal Co.
Do.	North	Breese Coal Co.
Do.	Cantine No. 4	Lumaghi Coal Co.
Do.	Deer Creek	Deer Creek Coal Co.
Do.	Green Diamond	Mid-Continent Coal Corp.
Do.	No. 16	Sahara Coal Company, Inc.
Do.	Golden Rule	Golden Rule Coal Co.
Do.	New Kathleen	Union Colliery Co.
Do.	No. 1	Bluff Coal Co.
Do.	Mary Kay	New West Side Coal Co., Inc.
Do.	Livingston No. 1	Livingston-Mt. Olive Coal Co.
Do.	No. 4	Superior Coal Co.
Do.	Riverton	Farrand Coal Co.
Do.	Little Dog	Little Dog Coal Co.
Do.	Moffat No. 2	Moffat Coal Co.
Do.	No. 1	Joliana Mining Co.
Do.	Crown	Freeman Coal Mining Corp.
Do.	St. Ellen	Perry Coal Co.
Do.	Virden	Virden Mining Co.
Do.	Carmac	Carmac Coal Co.
Do.	Bradbury	Midwest Utilities Coal Corp.

*Mines appear in both tables 2 and 3.

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APPENDIX H (Con.)

TABLE 3. - Title II mines at which no imminent dangers (Sec. 203(a)) or violations of Sec. 209 under Title II were observed during an inspection (Con.)

1954		
State	Mine	Company
Illinois (Con.)....	No. 10	Peabody Coal Co.
Do.	No. 8	Do.
Do.	East Breese	Citizens Coal Co.
Do.	New Black Crystal	Black Crystal Coal Co.
Do.	No. 3	No. 3 Coal Corp.
Do.	Bois	Bois Coal Co.
Do.	Kildee No. 3	Pschirrer & Sons Coal Co.
Do.	Lee	Lee Coal Mining Co.
Do.	Belle Valley	Belle Valley Coal Co.
Do.	Murdock mine, Murdock Division	Bell & Zoller Coal Co.
Indiana	No. 1	Three Coal Co.
Do.	White Ash	White Ash Coal Co.
Iowa	New Sterling No. 3	Sunshine Coal Co.
Do.	No. 4	Sunshine Coal Co.
Do.	Shamrock	Shamrock Coal Co.
Do.	Riverside	Riverside Coal Co.
Do.	Old King	Old King Coal Co.
Do.	D. C.	D. C. Coal Co.
Kansas	DeGasperi	DeGasperi Coal Co.
Do.	Quality	Quality Coal Co.
Kentucky	No. 21	The United Electric Coal Co.
Do.	Peckenpaugh	Peckenpaugh Coal Co.
Do.	Meadows	Meadows Coal Co.
Do.	Kirk No. 5	Kirk Coal Mining Co.
Do.	East Diamond	West Kentucky Coal Co.
Do.	Franklin	Franklin Coal Co.
Do.	Williams	Williams Bros. Coal Co.
Do.	No. 1	Wallace Valley Coal Co.
Do.	Pleasant View	West Kentucky Coal Co.
Do.	Coiltown	Coiltown Mining Co.
Do.	Atkinson	West Kentucky Coal Co.
Do.	Lavada	Lavada Coal Co.
Do.	Chesley Franklin	Chesley Franklin Coal Co.
Do.	No. 3	Blanton & Rice Coal Co.
Do.	No. 2	Boldman Fuel Co.
Do.	Hellier No. 2	Cauldill Ward Coal Co.
Do.	New Cinderella	Cinderella Coal Corp.
Do.	C. & C. Alma	Cline & Chambers Coal Co.
Do.	*Hendrix	Consolidation Coal Corp. (Ky.)
Do.	*No. 204	Do.
Do.	*No. 214	Do.
Do.	Stone No. 8	Eastern Coal Corp.
Do.	Stone No. 3	Do.
Do.	Kona No. 2	Elkhorn Coal Corp.
Do.	No. 1	Elkhorn Summitt Coal Co.
Do.	Freeburn	Emporor Coal & Coke Co.
Do.	No. 3	Everidge Coal Co.

*Mines appear in both tables 2 and 3.

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APPENDIX H (Con.)

TABLE 3. - Title II mines at which no imminent dangers (Sec. 203(a)) or violations of Sec. 209 under Title II were observed during an inspection (Con.)

1954		
State	Mine	Company
Kentucky (Con.)	No. 1	Feds Creek Coal Co., Inc.
Do.	No. 4	Hellier Coal & Coke Co.
Do.	No. 2	Hill Gail Coal Corp.
Do.	Wisconsin Steel mines	International Harvester Co.
Do.	No. 1	Majestic Collieries
Do.	Poplar Gap No. 1	Do.
Do.	No. 2	M. & B. Collieries, Inc.
Do.	No. 3	Middle Point Coal Co.
Do.	No. 1	Mill Branch Coal Co.
Do.	*Pond Creek	Norfolk & Western Railway Co. (Fuel Dept.)
Do.	*Thacker No. 5	Do.
Do.	*Winifrede No. 2	Do.
Do.	New Alma	New Alma Coal Co.
Do.	No. 3	Peem Coal Co.
Do.	No. 4	Do.
Do.	Alma	Phelps Collieries, Inc.
Do.	*Republic No. 4	Republic Steel Corp.
Do.	*Republic D	Do.
Do.	Russell Fork	Russell Fork Coal Co.
Do.	Laviers No. 2	Southeast Coal Co.
Do.	Big Chief	Do.
Do.	No. 1	Tutor Key Coal Co.
Do.	No. 30	U. S. Steel Co.
Do.	No. 31	Do.
Do.	No. 32	Do.
Do.	No. 4	W. & M. Coal Co.
Do.	No. 3	West Virginia & Kentucky Coal Corp.
Do.	Lampliter	Woodside Mines, Inc.
Do.	Algoma Block No. 5A section	Algoma Block Coal Co.
Do.	Big Jim	Big Jim Coal Co.
Do.	Harlan	Black Star Coal Corp.
Do.	Leatherwood No. 2	Blue Diamond Coal Co.
Do.	No. 5A	Do.
Do.	No. 7	Blue Bird Mining Co.
Do.	No. 9	Carrs Fork Coal Co.
Do.	No. 6	Clear Fork Coal Co.
Do.	Clover Splint	Closplint Coal Co.
Do.	Clover Fork	Clover Fork Coal Co.
Do.	Pacemaker	Congleton Brothers Coal Co.
Do.	Crummies Nos. 1 & 2	Crummies Creek Coal Co.
Do.	Sapphire No. 1	Elkhorn Jellico Coal Co.
Do.	Sapphire No. 2	Do.
Do.	No. W-20	Hagans & Hall Coal Co.
Do.	Brookside	Harlan Collieries Co.
Do.	Hi-Lo No. 2	High Splint Coal Co.
Do.	Sunfire	Kentucky Sun Coal Co.

*Mines appear in both tables 2 and 3.

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APPENDIX H (Con.)

TABLE 3. - Title II mines at which no imminent dangers (Sec. 203(a)) or violations of Sec. 209 under Title II were observed during an inspection (Con.)

1954		
State	Mine	Company
Kentucky (Con.).....	No. 9	Knott Coal Corp.
Do.	No. 1	Margin Coal Co.
Do.	Davisburg	Margo Coal Mining Co.
Do.	Mill Ridge	Mill Ridge Coal Co.
Do.	Midland No. 2	Old King Mining Co.
Do.	No. 2	Do.
Do.	Liggett	Parkins Harlan Coal Co.
Do.	Princess No. 1A	Princess Elkhorn Coal Co.
Do.	Princess No. 2	Do.
Do.	No. 12A	Reed and Hayes Coal Co.
Do.	Liberty No. 2	Sammons and Reed Coal Co.
Do.	Smith No. 1	Smith Coal Co.
Do.	No. 2	Do.
Do.	Stoker	Stoker Coal Co.
Do.	*High Splint No. 1 Glenbrook colliery	Stonega Coke and Coal Co.
Maryland	No. 10	Consolidated Fuel Co., Inc.
Missouri	Baiotto	Billy Creek Coal Co.
Do.	Macey	Ashford Coal Co.
Do.	Klondike	Mosby Coal Co., Inc.
Do.	Blacksmith	Blacksmith Coal Co., Inc.
Do.	No. 8	Corrigan Coal Co.
Do.	Bradley	D. L. Bradley Coal Co.
Do.	Ol'Elliott	Moberly Fuel Co., Inc.
Do.	Perry Rice	Perry Rice Coal Co.
Do.	No. 4	Clark Coal Co.
Montana	Brophy	Brophy Coal Co.
Do.	Klein No. 2	Republic Coal Co.
Do.	Roundup No. 3	Roundup Mining Co.
Do.	Keene No. 2	Mountain States Mining Co.
New Mexico	Koehler Nos. 1 and 2	St. Louis, Rocky Mountain & Pacific Co.
Ohio	Dry Fork	Dry Fork Coal Co.
Do.	Piney Fork No. 1	Hanna Coal Co.
Do.	Glen Castle No. 6	Do.
Do.	Norton No. 2	The David Z. Norton Co.
Do.	No. 56	Oskey Coal Co.
Oklahoma	*Carbon No. 5	Lone Star Steel Co.
Do.	*McCurtain	Do.
Do.	Blackstone	Ben Hur Coal Co.
Do.	Starr No. 2	Starr Coal, Inc.
Pennsylvania (anthracite)	*No. 10 slope	Ardoline Coal Co.
Do.	Kidney slope	Bird Mining Co.
Do.	No. 9 slope	Beaver Meadow Mining Co.
Do.	*Kirmar slope	Biscontini & Sons Coal Co.
Do.	*No. 58 slope	Do.

*Mines appear in both tables 2 and 3.

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APPENDIX H (Con.)

TABLE 3. - Title II mines at which no imminent dangers (Sec. 203(a)) or violations of Sec. 209 under Title II were observed during an inspection (Con.)

1954		
State	Mine	Company
Pennsylvania (Con.) (anthracite).....	No. 99 slope	Biscontini & Sons Coal Co.
Do.	Boslego slope	Boslego Coal Co.
Do.	No. 3 slope	Brunetti Coal Co.
Do.	No. 91 slope	Steve J. Bilko Coal Co.
Do.	Archbald shaft	The Continental-Archbald Coal Co.
Do.	Packer colliery	Duryea Anthracite Co.
Do.	Hunter Tunnel mine	Drift Contracting Co.
Do.	No. 60 slope	Dimario Coal Co.
Do.	No. 3 slope	Dancott Coal Co.
Do.	Johnson mine	DeAngelis Coal Co.
Do.	No. 1 slope	Joseph P. Dando & Co.
Do.	Buttonwood colliery	Glen Alden Coal Co.
Do.	Empire shaft, Empire-Kidder-colliery	Do.
Do.	Sugar Notch colliery	Do.
Do.	Kidder slope, Empire-Kidder-colliery	Do.
Do.	Huber colliery	Do.
Do.	Nottingham colliery	Do.
Do.	Avondale colliery	Do.
Do.	Wanamie colliery	Do.
Do.	Audenried colliery	Do.
Do.	Loomis colliery	Do.
Do.	South Wilkes-Barre colliery	Do.
Do.	Woodward colliery	Do.
Do.	No. 9 Tunnel mine	Genelow Mining Co.
Do.	No. 30 drift	Gianforcaro Coal Co.
Do.	Powderly mine	Gillen Coal Co.
Do.	No. 14 slope	Gubbiotti Coal Co.
Do.	Gaylord colliery	Gaylord Coal Co.
Do.	Butler slope	Guzior Coal Co.
Do.	No. 5 mine, Loree colliery	The Hudson Coal Co.
Do.	No. 3 mine, Loree colliery	Do.
Do.	Gravity slope	Do.
Do.	Coal Brook colliery	Do.
Do.	Marvine colliery	Do.
Do.	Baltimore colliery	Do.
Do.	No. 4 Lykens slope	Hentz Coal Co.
Do.	Henry E shaft	Harry E Coal Co.
Do.	Heidelberg colliery	Heidelberg Coal Co.
Do.	Indian Head colliery	Indian Head Coal Co.
Do.	Coal Creek slope	Do.
Do.	Stockton colliery, No. 3 slope	Jeddo-Highland Coal Co.

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APPENDIX H (Con.)

TABLE 3. - Title II mines at which no imminent dangers (Sec. 203(a)) or violations of Sec. 209 under Title II were observed during an inspection (Con.)

1954		
State	Mine	Company
Pennsylvania (Con.) (anthracite)	Owl Hole mine, Eckley colliery	Jeddo-Highland Coal Co.
Do.	Drifton colliery	Do.
Do.	Jeddo No. 24 slope	Do.
Do.	Highland No. 5 mine	Do.
Do.	Schooley colliery	Knox Coal Co.
Do.	River slope	Do.
Do.	Henry colliery, Henry shaft	Lehigh Valley Coal Co.
Do.	Enterprise slope, Henry colliery	Do.
Do.	Wyoming No. 8 slope, Henry colliery	Do.
Do.	Hazleton shaft	Do.
Do.	Dorrance colliery	Do.
Do.	Humboldt colliery	Lattimer Coal Co.
Do.	Greenwood mine, Tamaqua colliery	Lehigh Navigation Coal Co., Inc.
Do.	No. 18 slope	Labonoski Coal Co.
Do.	Red Ash mine	Larksville Coal Co.
Do.	Seven Foot slope	L. and M. Coal Co.
Do.	Maffei slope	Maffei Coal Co.
Do.	Fuller slope	Maltby Coal Co.
Do.	No. 2 shaft, No. 10 tunnel, Nos. 15 & 16 slopes, Storrs colliery	Moffat Coal Co.
Do.	Erie colliery	Motley Coal Co.
Do.	Connell mine	Mildred Coal Co.
Do.	Nos. 1 & 2 slopes	Michael Mining Co.
Do.	No. 4 slope	Mazzoni Coal Co.
Do.	Molinski colliery	Molinski Coal Co.
Do.	Mountain slope	Mountain Slope Coal Co.
Do.	*No. 1 slope	Newport Excavating Co.
Do.	*No. 2A slope	Do.
Do.	No. 10 slope	Northwest Coal Co.
Do.	*No. 1A slope	Newport Excavating Co.
Do.	No. 52 slope	No. 52 Slope Coal Co.
Do.	No. 9 colliery	No. 9 Coal Co.
Do.	No. 11 slope	No. 11 Coal Co.
Do.	No. 3 tunnel	Penag Coal Co.
Do.	Maple Hill colliery	Phila. & Reading Coal & Iron Co.
Do.	Oak Hill colliery	Do.
Do.	Potts colliery	Do.
Do.	No. 11 slope	Ploskonka Coal Co.
Do.	Taylor shaft	Pyne-Taylor Co., Inc.
Do.	Pyne mine	Do.

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APPENDIX H (Con.)

TABLE 3. - Title II mines at which no imminent dangers (Sec. 203(a)) or violations of Sec. 209 under Title II were observed during an inspection (Con.)

1954		
State	Mine	Company
Pennsylvania (Con.) (anthracite)	Primrose slope	Peca Coal Co.
Do.	Breaker slope	Pompey Coal Co.
Do.	Hoyt shaft, Ewen colliery	Pennsylvania Coal Co.
Do.	Bell Mountain slope	Rogers Brothers
Do.	Archbald slope No. 184	Do.
Do.	Renninger colliery	Renninger Coal Co.
Do.	Rushbrook slope	Rushbrook Coal Co.
Do.	No. 2 shaft colliery	Russell Mining Co., Inc.
Do.	Germantown colliery	Raven Run Coal Co.
Do.	No. 16 slope, No. 7 colliery	Susquehanna Collieries Division, The M. A. Hanna Co.
Do.	No. 2 shaft, No. 7 colliery	Do.
Do.	Glen Burn colliery	Do.
Do.	Maysville No. 1 slope, Glen Burn colliery	Do.
Do.	Maysville No. 2 slope, Glen Burn colliery	Do.
Do.	*Glen Lyon colliery	Do.
Do.	Spearhead mine	Spearhead Mining Co.
Do.	Nos. 2, 7, and Rex slopes	Sarf Coal Co.
Do.	Saint Clair colliery	Saint Clair Coal Co.
Do.	Capone colliery	Sam Capone Coal Co.
Do.	Powder Mill Slope mine	Sobleskie Coal Co.
Do.	Penna. No. 1 slope	Snyder Coal Co.
Do.	Sharp Mountain drift	Sharp Mountain Coal Co.
Do.	Sussex slopes	Sussex Coal Co.
Do.	Underwood slope	Village Slope Coal Co.
Do.	Hyde Park mine	West Slope Coal Corp.
Do.	No. 15 slope	West Exeter Coal Mining Co.
Pennsylvania (bituminous)	Avenue No. 2	Allegheny Coal & Coke Co.
Do.	Banning No. 1	Republic Steel Corp.
Do.	Black Hollow	Mateer Coal Co.
Do.	Bowman No. 2	Bowman Coal Co.
Do.	*Bridgeport	U. S. Steel Corp.
Do.	*Collier	Do.
Do.	Colonial Plant	Do.
Do.	Coyer No. 3	I. E. & Walter Coyer Coal
Do.	Decker No. 3	Powell Coal Co.
Do.	Dunkard No. 2	Island Coal Co.
Do.	Evans No. 3	Evans Coal Co.
Do.	Fleck No. 3	Fleck Coal Co.
Do.	Frogtown	Allaman Mining Co.
Do.	*Harwick	Duquesne Light Co.

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APPENDIX H (Con.)

TABLE 3. - Title II mines at which no imminent dangers (Sec. 203(a)) or violations of Sec. 209 under Title II were observed during an inspection (Con.)

1954		
State	Mine	Company
Pennsylvania (Con.) (bituminous).....	*Indianola	Republic Steel Corp.
Do.	*Isabella	Weirton Coal Co.
Do.	*Karen	U. S. Steel Corp.
Do.	Leckrone No. 2	Leckrone Coal & Coke Co.
Do.	Leisenring No. 1	U. S. Steel Corp.
Do.	*Leisenring No. 2	Do.
Do.	*Leisenring No. 3	Do.
Do.	Magee	Westmoreland Coal Co.
Do.	*Maxwell	U. S. Steel Corp.
Do.	Melcroft	Eastern Gas & Fuel Assoc.
Do.	Moffitt	Molnar Bros. Coal Co.
Do.	Montour No. 4	Pittsburgh Coal Co.
Do.	Montour No. 8	Sal-Ray Coal Co., Inc.
Do.	Myers No. 3	Geo. K. Brennen
Do.	National No. 3	U. S. Steel Corp.
Do.	No. 1	North Sewickly Coal Co.
Do.	Old Eagle	Rathgeb & Gorr Coal Co.
Do.	Park-Armstrong	Leechburg Mining Co.
Do.	Pennsy	Bowie Coal Co.
Do.	*Poland No. 1	Molnar Bros. Coal Co.
Do.	Riddle	Sarver Coal Co.
Do.	Ronco	U. S. Steel Corp.
Do.	Rovella	Kerry Coal Co.
Do.	*Russellton	Republic Steel Corp.
Do.	Seger No. 1	Atlantic Crushed Coke Co.
Do.	No. 6	Sekora's Coal
Do.	*Springdale	Allegheny Pittsburgh Coal Co.
Do.	Turkey Run	C. H. & R. Coal Co., Inc.
Do.	Wildwood	Butler Consolidated Coal Co.
Do.	York Run No. 3	Williams Coal Co.
Do.	No. 2 mine	Acosta-Gray Co.
Do.	No. 8 mine	"B" Quality Coal Co.
Do.	Eureka No. 35 Upper mine	Berwind-White Coal Mining Co.
Do.	No. 72 mine	Bethlehem Mines Corp.
Do.	No. 73 mine	Do.
Do.	No. 74 mine	Do.
Do.	No. 2 mine	Bird Coal Co.
Do.	Cambria No. 11 mine	Cambria Fuel Co.
Do.	Cambria Mills No. 2 mine	Cambria Mills Coal Co.
Do.	Sal No. 1 mine	Coal Mining Company of Graceton, Inc.
Do.	Sonman Slope "E" mine	Eastern Gas and Fuel Associates, Coal Division
Do.	Huskin No. 6 mine	Gahagen Coal Co.
Do.	Haws Shaft mine	Haws Refractories Co.
Do.	Hoover No. 1 mine	I. H. Hoover & Son
Do.	Lilly No. 3 mine	C. A. Hughes & Co.

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APPENDIX H (Con.)

TABLE 3. - Title II mines at which no imminent dangers (Sec. 203(a)) or violations of Sec. 209 under Title II were observed during an inspection (Con.)

1954		
State	Mine	Company
Pennsylvania (Con.) (bituminous).....	Cambria Smokeless No. 1 mine	Imperial Coal Corp.
Do.	Cardiff No. 1 mine	Do.
Do.	Imperial Keystone mine	Do.
Do.	Portage No. 4 mine	Johnstown Coal & Coke Co.
Do.	Lingle No. 7 mine	Lingle Coal Co.
Do.	Loyal Hanna No. 6 mine	Loyal Hanna Coal & Coke Co.
Do.	McClure No. 2 mine	McClure Coal Co.
Do.	Maxton Slope No. 1 mine	Morrisdale Coal Mining Co.
Do.	No. 1 mine	Morrison Coal Co.
Do.	Mt. Carmel No. 2 mine	Moshannon Falls Mining Co.
Do.	Kramer mine	Northwestern Mining & Exchange Co.
Do.	Ponfeigh Pine Hill mine	Pine Hill Smokeless Coal Co.
Do.	Sonman No. 2 mine	W. H. Piper and Company, Inc.
Do.	Reitz No. 3 Lower mine	Reitz Coal Co.
Do.	Reitz No. 4 mine	Do.
Do.	Ernest No. 1 mine	Rochester & Pittsburgh Coal Co.
Do.	Kent No. 2A mine	Do.
Do.	Kent No. 5 mine	Do.
Do.	Troxell No. 2 mine	Scott Bros. Coal Co.
Do.	Scurfield No. 2 mine	Scurfield Coal Co.
Do.	Sterling No. 6 mine	Sterling Coal Co.
Do.	Harrison No. 2 mine	The Saxman Coal and Coke Co.
Do.	Tyler No. 14 mine	Underhill Coal Mining Co.
Do.	Orchard No. 5 mine	Woolridge Coal Co.
Do.	Pheasant Hollow mine	Worthville Coal Co.
Do.	Lincoln mine	Joseph E. Yobbagy
Tennessee.....	No. 1	Rich Mountain Coal Co.
Do.	Meadow Creek	Clinchfield Coal Corp.
Do.	No. 1	New River Fuel Co.
Do.	Red Ash No. 2	High Point Coal Co.
Do.	No. 1	Mountain Top Coal Co.
Do.	Moore	Pocahontas Fuel Co.
Do.	Coal Valley	Tennessee Consolidated Coal Co.
Do.	ABC mine	A B C Coal Co.
Do.	Southern collieries mine	Southern Collieries, Inc.
Do.	No. 7	Fentress Coal and Coke Co.
Do.	No. 1	Hood and Mullinix Coal Co.
Utah	King	United States Fuel Co.
Do.	Western	Western Coal Mining Co.
Do.	Rains No. 3	Hi-Heat Coal Co.
Do.	Columbia	Columbia-Geneva Steel Division United States Steel Corp.
Do.	*Sunnyside No. 2	Kaiser Steel Corp.
Do.	Wattis Nos. 1 & 2	Lion Coal Corp.
Do.	Castle Gate No. 2	Independent Coal & Coke Co.
Do.	Spring Canyon No. 4	Spring Canyon Coal Co.

*Mines appear in both tables 2 and 3.

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APPENDIX H (Con.)

TABLE 3. - Title II mines at which no imminent dangers (Sec. 203(a)) or violations of Sec. 209 under Title II were observed during an inspection (Con.)

1954		
State	Mine	Company
Utah (Con.).....	Geneva	Columbia-Geneva Steel Division, United States Steel Corp.
Do.	*Book Cliffs	Book Cliffs Coal Co.
Do.	*Sunnyside No. 3	Kaiser Steel Corp.
Do.	Clear Creek	Independent Coal & Coke Co.
Do.	Browning	Arthur J. Petty
Virginia	Calvin	Blackwood Fuel Co.
Do.	No. 2	Cassell Coal Co.
Do.	No. 4	Christie Coal & Coke Co.
Do.	No. 9	Clinchfield Coal Corp.
Do.	*Moss No. 1	Do.
Do.	*Moss No. 3	Do.
Do.	Moss No. 4	Do.
Do.	Meade No. 2	Do.
Do.	No. 2	Garden Smokeless Coal Co.
Do.	No. 3	Holly Creek Coal Co.
Do.	No. 3	Lambert Coal Co.
Do.	No. 1	Lyttle Coal Co.
Do.	North Side	North Side Coal Co.
Do.	No. 1	Page Pocahontas Coal Corp.
Do.	Meade	Pressley Coal Co.
Do.	Seaboard No. 1	Rebecca Coal Co.
Do.	Kennedy	Red Jacket Coal Corp.
Do.	Keen Mountain	Do.
Do.	Tacoma	Ruth Elkhorn Coals, Inc.
Do.	Splash Dam	Splash Dam Coal Corp.
Do.	*Crossbrook	Stonega Coke & Coal Co.
Do.	*Moss No. 2	Clinchfield Coal Corp.
Do.	Derby	Stonega Coke and Coal Co.
Do.	Roda No. 3	Do.
Do.	Roda No. 5	Do.
Do.	Buccaneer No. 3	Sycamore Coal Corp.
Do.	Virginia-Lee	Virginia Lee Co., Inc.
Do.	No. 2	Willie Bentley Coal Co.
Do.	No. 4	Wise Coal & Coke Co.
Washington	Jones	B. & R. Coal Co.
West Virginia	No. 1	Pine Swamp Mining Co.
Do.	Bergoo No. 4 4B Opening	Pardee and Curtin Lumber Co.
Do.	Haller	Haller Coal Co.
Do.	No. 4	Pardee and Curtin Lumber Co.
Do.	Kingmont	The Virginia and Pittsburgh Coal & Coke Co.
Do.	Borgman No. 5	Borgman Coal Co.
Do.	Borgman No. 10	Do.
Do.	Glen Cambria No. 1	Mountain Fuel Co.
Do.	Mason-Dixon No. 1	L. and W. Coal Co.
Do.	Oak Ridge	Kemp Coal Co.

*Mines appear in both tables 2 and 3.

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APPENDIX H (Con.)

TABLE 3. - Title II mines at which no imminent dangers (Sec. 203(a)) or violations of Sec. 209 under Title II were observed during an inspection (Con.)

1954		
State	Mine	Company
West Virginia (Con.)	Lockview No. 2	Lockview Coal Co.
Do.	Wendel, Nos. 1 and 2	Wendel Coal Co.
Do.	East Run air shaft	Joanne Coal Co.
Do.	No. 4	Johnson Coal Co.
Do.	Johnstown No. 1	Harris Coal Co.
Do.	No. 3	Compass Coal Co.
Do.	Canyon	Tasa Coal Co.
Do.	No. 2	G. and L. Coal Co.
Do.	Berryburg No. 1	Smith Coal Co.
Do.	Junior No. 2	Junior Coal Co.
Do.	Ream No. 6B	Kray Coal Co., Inc.
Do.	No. 2	Compass Coal Co.
Do.	Nixon mine, Nos. 4 and 5 openings	Nixon Coal Co.
Do.	No. 4	Bakers Ridge Coal Co.
Do.	Ream No. 1	Kray Coal Co.
Do.	Tunnelton	Tunnelton Cooperative Coal Co.
Do.	Lynn mine	Lake Lynn Fuel Co.
Do.	Acme	Acme Coal Co.
Do.	Bakers Ridge No. 3	Bakers Ridge Coal Co.
Do.	Ream No. 2	Kray Coal Co.
Do.	Beech Bottom	Windsor Power House Coal Co.
Do.	Donegan 3-C	Donegan Coal & Coke
Do.	Peach Cr. Chilton	Jewell Ridge Coal Co.
Do.	No. 1	Buffalo Chilton Coal Co.
Do.	No. 2	Shamblin Coal Co.
Do.	No. 10	Slab Fork Coal Co.
Do.	Lieving	Lieving Coal Co.
Do.	Page No. 8	Eastern Gas & Fuel Associates
Do.	No. 3	Guyan Eagle Coal Co.
Do.	No. 8	Lorado Coal Mining Co.
Do.	Pinnacle No. 6	Am. Coal Co. of Allegany County
Do.	Herndon	Lamar Colliery Co.
Do.	Snap Creek No. 2	Snap Creek Coal Co.
Do.	No. 1	Chilton Hernshaw Coal Co.
Do.	No. 6A	Imperial Colliery Co.
Do.	No. 1-C	Amherst Coal Co.
Do.	*No. 6	U. S. Steel Corp.
Do.	Brule 5, 3 & 4	Brule Smokeless Coal Co.
Do.	No. 3	Arlington Poca. Coal Co.
Do.	Ashland No. 6	Ashland Mining Corp.
Do.	No. 9	Do.
Do.	McDowell No. 6	Do.
Do.	No. 9	Arlington Pocahontas
Do.	No. 6	Arlington Pocahontas Coal Co.
Do.	Kopperston No. 2	Eastern Gas & Fuel Associates
Do.	*No. 3	U. S. Steel Corp., Coal Division
Do.	Lady Dunn 100A	Cannelton Coal & Coke Co.

*Mines appear in both tables 2 and 3.

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APPENDIX H (Con.)

TABLE 3. - Title II mines at which no imminent dangers (Sec. 203(a)) or violations of Sec. 209 under Title II were observed during an inspection (Con.)

1954		
State	Mine	Company
West Virginia (Con.)	Page	Page Coal & Coke
Do.	Angle	Pocahontas Fuel Co.
Do.	Wyco	Clinchfield Coal Corp.
Do.	Coaldale	Pocahontas Fuel Co., Inc.
Do.	Medo Fuel	Medo Fuel Co.
Do.	No. 14-No. 3 Seam	U. S. Steel Corp., Coal Division
Do.	No. 5	Orlandi Coal Co.
Do.	Page No. 7	Eastern Gas & Fuel Associates
Do.	No. 6 East	U. S. Steel Corp., Coal Division
Do.	*Huff Mountain	Redyard Coal Co.
Do.	Quinwood No. 3	Imperial Smokeless Coal Co.
Do.	*No. 9	U. S. Steel Corp., Coal Division
Do.	No. 5 Block	Truax-Traer Coal Co.
Do.	Sewell Chief	Woolridge Coal Mining Co.
Do.	No. 2	Swiss Coal Co.
Do.	No. 2	U. S. Steel Corp., Coal Division
Do.	Ansted	Gauley Mountain Coal Co.
Do.	Crane Cr. Nos. 1 & 9	American Coal Co.
Do.	No. 4	Ridgeview Coal Co.
Do.	No. 11	Page Coal & Coke Co.
Do.	No. 17 Bottom	Red Jacket Coal Corp.
Do.	Coal Mountain No. 9	Do.
Do.	*Hernshaw	Electro-Metallurgical Co.
Do.	Emily	Warner Collieries
Do.	Arlington No. 1	Arlington Pocahontas
Do.	No. 3	Craigsville Coal Co.
Do.	*No. 3	Red Bird Mining Co.
Do.	Van No. 1	Youghiogheny & Ohio Coal Co.
Do.	McGregor No. 6	Amherst Coal Co.
Do.	No. 1	Otter Creek Coal Co.
Do.	No. 5	Guyan Eagle Coal Co.
Do.	Piedmont	American Coal Co.
Do.	Slab Fork No. 1	Slab Fork Coal Co.
Do.	No. 22	Island Creek Coal Co.
Do.	No. 26	Do.
Do.	Nellis No. 5	Armco Steel Co.
Do.	KC No. 5	Valley Camp Coal Co.
Do.	No. 7	Riverton Coal Co.
Do.	LeMoyne No. 2	Chemical Coal Co.
Do.	Cornelia	Peters Creek Coal Co.
Do.	No. 1 Punch	Red Parrot Coal Co.
Do.	Carbon No. 12	Carbon Fuel Co.
Do.	Crane Cr. No. 11	Am. Coal Company of Allegany County
Do.	Pinnacle N & S	Do.
Do.	Montcoal No. 1	Armco Steel Corp.
Do.	No. 3	Wyborn Coal Co.
Do.	Royalty No. 1	Royalty Smokeless Coal Co.
Do.	Royalty 2A	Do.
Do.	No. 2	Electro-Metallurgical Co.
Do.	East Gulf 2-A	C. H. Mead Coal Co.
Do.	No. 1	Gray Eagle Coal Co.
Wyoming	*Peacock No. 12	Colony Coal Co.
Do.	D. O. Clark	The Union Pacific Coal Co.

*Mines appear in both tables 2 and 3.

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APPENDIX I

TABLE 1. - Distribution of Coal-Mine Inspectors and Electrical Inspectors December 31, 1954

Office	Coal-mine inspectors						Coal-mine electrical inspectors		
	GS-9	GS-11	GS-12	GS-13	GS-14	Total	GS-9	GS-11	Total
Anchorage			1			1			
Seattle			2			2			
Denver	2	5	4		1	12			
Salt Lake City	1	1	2	1		5			
Phoenix		1				1			
Duluth		1				1			
McAlester		3	1	1		5		1	1
Birmingham	3	6	3		1	13			
Jellico	1	6	2	1		10	1		1
Pittsburgh	4	8	9		1	22	1	1	2
Johnstown	7	5	8	1		21	1		1
St. Clairsville	4	5	3	1		13			
Morgantown	2	9	5	1		17	1		1
Mt. Hope	6	17	12		1	36			
Norton	8	12	7	1		28		1	1
Barbourville	6	8	4	1		19		1	1
Vincennes	2	9	9	1	1	22		1	1
Wilkes-Barre	3	13	10		1	27			
General				5		5			
Total	49	109	82	14	6	1/260	4	5	9
Vacancies						13			1
Allotted						273			10

1/ Includes:
6 district supervisors (excluding Districts F and G).
8 subdistrict supervisors (excluding Seattle, Phoenix, and Albany, N. Y.).
2 safety representatives (Liaison Officers - Washington).
2 technical assistants (Washington).
1 mines safety representative (Holmes Safety Association).

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APPENDIX I (Con.)

TABLE 2. - Distribution of engineers
December 31, 1954

Office	GS-9	GS-11	GS-12	GS-13	GS-14	GS-15	Total
Anchorage							
Seattle		1					1
Denver			1	1			2
Salt Lake City			1	1			2
Phoenix							
Duluth		1					1
McAlester							
Birmingham			1				1
Jellico			1				1
Pittsburgh		1	5	2			8
Johnstown			1				1
St. Clairsville		1					1
Morgantown			1				1
Mt. Hope	2	1	3				6
Norton	1		1				2
Barbourville							
Vincennes	1	1	1	1			4
Wilkes-Barre			2				2
General				2	2	1	5
Total	4	6	18	7	2	1	38
Vacancies							7
Allotted							45
Grand total							45

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APPENDIX J

Miscellaneous special assignments

Type of job	Anchorage	Seattle	Denver	Salt Lake City	Phoenix	Duluth	McAlester	Birmingham	Jellico	Pittsburgh	Johnstown	St. Clairsville	Morgantown	Mt. Hope	Norton	Barbourville	Vincennes	Wilkes-Barre	Total
Investigating auxiliary blower fans	0	4	13	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	18
Study of mining systems	0	1	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3
Study of cleaning plants (dust)	0	7	0	0	0	0	0	0	0	0	6	7	0	0	0	3	5	0	28
Investigating mine fires, explosions	0	3	3	2	0	0	0	0	1	0	0	5	4	7	0	5	0	0	30
Investigating nonfatal accidents	0	0	1	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	2
Participating in legal litigations	0	0	3	0	0	0	0	2	3	0	0	0	0	0	1	1	0	0	10
Investigating non-coal-mine accidents	0	0	1	7	0	0	0	0	0	0	0	0	0	0	0	0	0	0	8
Study of electrical circuits and equipment	0	0	16	1	0	0	2	10	0	2	0	1	0	1	0	0	2	0	35
Tests of diesel locomotives (noncoal)	0	0	3	1	0	0	0	0	0	0	0	0	0	1	0	0	0	0	5
Haulage study	0	0	2	2	0	0	0	0	0	4	0	0	0	0	0	1	0	0	9
Escorting visitors to mines and plants	0	0	4	2	0	0	0	0	0	9	3	0	0	0	0	0	0	0	18
Participated in civil defense maneuvers	0	0	1	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	2
Ventilation study	0	0	2	9	0	0	2	0	0	2	0	0	0	0	0	0	3	0	18
Investigating surface fires and explosions	0	0	1	1	0	0	0	0	0	0	0	3	0	1	0	0	0	0	6
Study of dust-allaying equipment	0	0	0	1	0	0	0	0	0	0	1	1	0	0	0	0	0	0	3
Safety inspection noncoal mines	0	0	0	2	8	0	2	0	0	0	0	0	0	0	0	0	0	0	12
Work on outcrop and abandoned mine fires	0	0	0	0	1	0	0	0	0	0	0	2	0	0	0	0	0	1	4
Assisting in the recovery of sealed fire area	0	0	4	0	0	0	0	0	0	0	0	0	0	1	0	1	1	0	7
Attending safety meetings	0	0	20	10	0	3	21	0	9	5	4	0	33	0	0	0	54	0	159
Assisting State departments	0	0	4	0	0	1	4	1	2	0	0	0	0	0	0	0	1	0	13
Officiating at first-aid and mine rescue contests	0	1	0	1	0	0	0	0	2	0	0	0	5	0	0	0	2	0	11
Explosives study	0	0	0	0	0	0	3	0	0	4	0	1	0	0	0	0	3	0	11
Attending job-training course	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	1
Conferences with other Federal agencies	0	0	0	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	2
Roof-control study	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	0	0	0	2
Float-dust studies	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2
Conducting electrical safety course	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	1
Assisting in mine-gasification project	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	1
Congressional hearings on underground gas storage	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	1
Revisions of face equipment permissibility schedule	0	0	0	0	0	0	0	0	0	3	0	0	0	0	0	0	0	0	3
Assisting in safety motion pictures	0	0	0	0	0	0	0	0	0	2	0	0	0	0	0	0	0	0	2
Federal Coal-Mine Safety Board of Review hearings	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	1
Miscellaneous	0	0	10	4	1	6	9	1	1	10	0	3	1	3	1	2	6	0	58

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APPENDIX K

TABLE 1. - Number of injuries and rates per million man-hours exposure (portal-to-portal)

Period[1]	Fatal	Nonfatal	Man-hours	Rate		Change, percent			
				Fatal	Nonfatal	Fatal	Rate	Nonfatal	Rate
BITUMINOUS									
1932-41....	10,036	447,199	6,794,840,163	1.48	65.81				
1942-51....	8,889	416,646	7,496,573,667	1.18	55.58	-11	-20	-7	-16
1952-54[2]..	1,178	60,999	1,303,474,065	.90	46.80				
ANTHRACITE									
1932-41....	2,295	151,299	1,428,093,979	1.61	105.94				
1942-51....	1,537	110,234	1,374,622,564	1.11	80.19	-33	-31	-27	-26
1952-54[2]..	225	14,355	216,354,245	1.04	66.35				

1/ Calendar year.
2/ Final figures for 1952 included; 1953-54 are preliminary.

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APPENDIX K (Con.)

TABLE 2. - Number of fatal and nonfatal injuries and injuries per million man-hours exposure, portal-to-portal, in coal mines of the United States

Calendar year	Fatal injuries						Nonfatal injuries					
	Bituminous		Anthracite		Total		Bituminous		Anthracite		Total	
	Number	Rate	Number	Rate	Number	Rate	Number	Rate	Number	Rate	Number	Rate
1932....	958	1.77	249	1.59	1,207	1.73	39,352	72.58	16,931	107.88	56,283	80.50
1933....	833	1.31	231	1.49	1,064	1.34	43,946	68.87	15,183	98.13	59,129	74.58
1934....	958	1.41	268	1.50	1,226	1.43	46,982	69.39	18,577	104.15	65,559	76.63
1935....	968	1.46	274	1.78	1,242	1.52	47,529	71.47	15,897	103.16	63,426	77.43
1936....	1,098	1.43	244	1.56	1,342	1.45	50,514	65.62	17,026	108.80	67,540	72.91
1937....	1,198	1.54	215	1.58	1,413	1.55	52,847	68.05	13,412	98.72	66,259	72.62
1938....	880	1.52	225	1.94	1,105	1.59	36,794	63.47	12,842	110.85	49,636	71.36
1939....	867	1.36	211	1.71	1,078	1.42	38,544	60.52	13,229	107.37	51,773	68.12
1940....	1,204	1.68	184	1.50	1,388	1.65	43,994	61.28	13,782	112.55	57,776	68.75
1941....	1,072	1.35	194	1.49	1,266	1.37	46,637	58.93	14,420	110.83	61,057	66.26
1942....	1,245	1.41	226	1.64	1,471	1.44	53,193	60.21	13,581	98.73	66,774	65.40
1943....	1,225	1.39	226	1.50	1,451	1.40	51,067	57.79	13,527	89.68	64,594	62.44
1944....	1,124	1.23	174	1.06	1,298	1.20	51,253	56.02	12,438	76.05	63,691	59.06
1945....	925	1.13	143	1.01	1,068	1.11	46,194	56.52	10,923	77.32	57,117	59.58
1946....	795	1.09	173	1.14	968	1.10	42,817	58.81	12,533	82.65	55,350	62.93
1947....	985	1.23	173	1.18	1,158	1.22	46,025	57.32	11,635	79.41	57,660	60.72
1948....	862	1.15	137	.91	999	1.11	42,078	56.28	11,394	75.69	53,472	59.53
1949....	494	.93	91	.83	585	.91	27,548	51.67	7,857	71.88	35,405	55.11
1950....	550	.92	93	.80	643	.90	28,390	47.73	8,874	76.14	37,264	52.38
1951....	684	1.16	101	.95	785	1.13	28,081	47.56	7,472	69.94	35,553	50.99
1952....	449	.90	99	1.03	548	.92	23,719	47.64	6,355	66.35	30,074	50.66
1953[1/]..	396	.84	64	.91	460	.84	21,820	46.04	4,455	63.09	26,275	48.25
1954[1/]..	333	1.00	62	1.24	395	1.04	15,460	46.62	3,545	70.96	19,005	49.81

1/ Preliminary data subject to revision.

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APPENDIX K (Con.)

TABLE 3. - Major coal-mine disasters in the United States and number of persons killed

Calendar year	Number of major disasters	Number of persons killed
1932	6	145
1933	1	7
1934	2	22
1935	4	35
1936	5	37
1937	6	101
1938	6	84
1939	1	28
1940	6	276
1941	8	73
1942	7	132
1943	8	174
1944	4	94
1945	5	68
1946	2	27
1947	6	179
1948	6	49
1949	0	0
1950	0	0
1951	5	157
1952	2	11
1953	1	5
1954	1	16

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APPENDIX K (Con.)

TABLE 4. - Underground fatality experience in the coal industry, Title I and Title II mines

	1954	1953	1952	1951
Bituminous:				
Title I mines:				
Fatalities	58	57	60	69
Percent	19.9	16.3	15.4	11.2
Rate[1]	3.55	2.40	2.32	2.41
Title II mines:				
Fatalities	233	292	329	549
Percent	80.1	83.7	84.6	88.8
Rate[1]	.98	.85	.87	1.32
Total fatalities	291	349	389	618
Rate[1]	1.15	.95	.97	1.39
Anthracite:				
Title I mines:				
Fatalities	13	11	16	8
Percent	25.5	18.3	18.8	9.0
Rate[1]	26.53	16.38	17.15	8.05
Title II mines:				
Fatalities	38	49	69	81
Percent	74.5	81.7	81.2	91.0
Rate[1]	1.14	1.07	1.08	1.20
Total Fatalities	51	60	85	89
Rate[1]	1.51	1.29	1.32	1.30
All coal:				
Title I mines:				
Fatalities	71	68	76	77
Percent	20.8	16.6	16.0	10.9
Rate[1]	4.22	2.80	2.84	2.61
Title II mines:				
Fatalities	271	341	398	630
Percent	79.2	83.4	84.0	89.1
Rate[1]	1.01	.87	.90	1.31
Total fatalities	342	409	474	707
Rate[1]	1.19	.98	1.01	1.38

1/ Per million man-hours.
Note: All figures for 1953 and 1954 subject to slight revision.

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APPENDIX L

Number of coal mines in the United States in which major improvements were made, 1954 and 1941-54

	Alabama	Alaska	Arizona	Arkansas	California	Colorado	Georgia	Idaho	Illinois	Indiana	Iowa	Kansas	Kentucky	Maryland	Michigan	Missouri	Montana	New Mexico	North Carolina	North Dakota	Ohio	Oklahoma	Oregon	Pennsylvania (anthracite)	Pennsylvania (bituminous)	Tennessee	Texas	Utah	Virginia	Washington	West Virginia	Wyoming	Total 1954	Total 1941-1954
1. Systematic roof-support adopted ..	1	1	0	4	-	2	0	0	11	1	0	0	43	0	-	7	1	1	-	0	33	0	0	2	25	21	-	4	26	0	29	0	212	2,475
2. Roof-support plan enforced	4	1	1	9	-	5	0	0	42	11	0	3	165	1	-	15	7	14	-	0	118	3	0	209	74	72	-	7	76	0	142	0	979	(1)
3. Use of black blasting powder discontinued	12	0	0	0	-	0	0	0	11	4	1	0	14	1	-	1	3	4	-	1	8	1	0	0	17	58	-	0	10	0	0	0	146	1,624
4. New main fan installed	14	0	0	1	-	5	0	0	7	2	0	0	69	1	-	2	0	3	-	0	12	2	0	5	36	34	-	1	23	1	39	0	257	2,919
5. Ventilation generally improved ...	6	3	1	3	-	7	0	0	60	15	2	1	146	8	-	9	2	4	-	2	70	1	0	63	72	46	-	15	56	1	83	5	681	(1)
6. Auxiliary blower fans removed	0	0	0	0	-	0	0	0	0	2	0	0	7	0	-	1	2	0	-	0	3	0	0	0	13	0	-	2	6	0	0	2	38	586
7. Preshift examinations for gas begun	6	1	0	2	-	2	0	0	8	6	0	0	48	10	-	8	6	4	-	0	13	0	0	8	43	8	-	2	21	0	47	1	244	3,146
8. Onshift examinations for gas begun	2	1	0	3	-	4	0	0	19	4	0	0	41	9	-	12	5	5	-	0	19	0	0	8	20	14	-	3	23	0	47	2	241	2,236
9. Use of water to allay dust begun..	1	1	0	0	-	0	0	0	1	0	0	0	3	0	-	0	0	0	-	0	0	0	0	0	3	0	-	8	3	0	5	0	25	1,028
10. Rock dust used for first time	4	1	0	0	-	1	0	0	2	0	0	0	23	0	-	0	0	0	-	0	13	0	0	0	7	6	-	2	60	0	10	0	129	1,868
11. General improvement in rock dusting	1	2	0	4	-	17	0	0	88	16	0	1	170	2	-	0	1	7	-	0	41	2	0	0	34	8	-	13	49	0	99	4	559	(1)
12. General improvement in haulage ...	1	2	0	1	-	2	0	0	8	5	0	1	51	0	-	7	0	0	-	0	53	4	0	24	37	1	-	1	11	0	170	2	381	(1)
13. Installation of protective electric devices	13	2	1	9	-	16	0	0	33	25	8	3	138	2	-	16	3	2	-	8	140	3	0	36	52	3	-	20	23	1	283	5	845	(1)
14. Second opening provided	4	0	0	0	-	2	0	0	3	3	0	0	11	1	-	0	0	0	-	0	3	0	1	7	9	10	-	2	2	0	21	2	81	963
15. Smoking underground discontinued..	5	0	0	2	-	0	0	0	11	11	0	0	10	1	-	0	3	0	-	0	10	0	0	2	18	7	-	0	8	0	18	0	106	1,679
16. Use of open lights discontinued ..	11	0	1	2	-	0	0	0	8	1	0	0	13	2	-	0	0	4	-	0	3	0	0	2	16	4	-	1	15	0	17	2	102	1,482

1/ Grand totals not given for these items because further improvements may have been made in some mines previously reported as showing improvements of the same type.

Int. - Bu. of Mines., Pa. 7164

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